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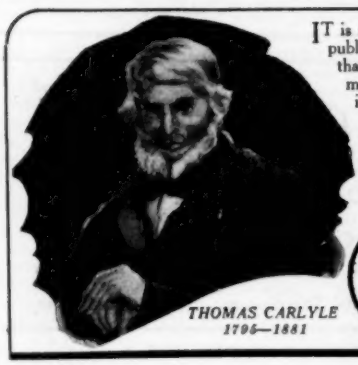

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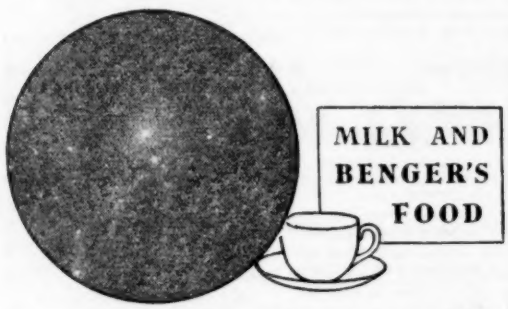

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ADDRESSES AND ORIGINAL ARTICLES

ŒSTROGENIC PROPERTIES OF STILBŒSTROL DIPROPIONATE AND HEXŒSTROL *

BY P. M. F. BISHOP, B.M. Oxfd
R. K. BOWES, M.D. Lond.
MURIEL BOYCOTT, B.Sc., M.B. Lond.
R. KELLAR, M.B. Edin., F.R.C.S.E., M.R.C.O.G.
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INTRODUCTORY NOTE (Dr. Bishop)

AT the request of the Therapeutic Trials Committee of the Medical Research Council the authors of this paper have investigated the effects of the administration of stilbœstrol dipropionate and hexœstrol on man. On June 22, 1939, a meeting was called at which the various workers reported verbally on their experiences with these two compounds. At this meeting the following general observations were made :—

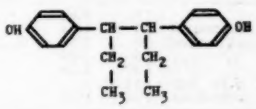
It was agreed that stilbœstrol dipropionate and hexœstrol were both active œstrogens in man, but that hexœstrol, given by mouth, appeared to be somewhat less active than stilbœstrol or its dipropionate.

There was general agreement that stilbœstrol dipropionate and hexœstrol both caused in some patients toxic effects (nausea and sickness) similar to those of the unesterified stilbœstrol, but the incidence of these effects appeared, on the available evidence, to be less with the two newer compounds. It had been found that giving the original stilbœstrol as sugar-coated tablets had not reduced the incidence of its side-effects. None of the clinicians present had seen any toxic jaundice after the administration of stilbœstrol—such as had been reported in France by Varangot (1939)—and none appeared to have been recorded by other clinicians in Britain.

It was resolved that the results of this work should be published. Dr. Robert Kellar kindly consented to collect the data, and he and I undertook to present them in a short paper for publication after it had been approved by the remaining authors. Before the collection of the data had been completed, Dr. Kellar was called up to join H.M. Forces, and the task has fallen to me. Since it is not now possible to get in touch with all the authors, I have confined myself as far as possible to the statement of fact. For any expression of opinion made in this paper I, and not my co-authors, am responsible.

CHEMISTRY OF STILBŒSTROL DIPROPIONATE AND HEXŒSTROL

The development of the stilbœstrol series of œstrogenic substances began with the demonstration by Dodds and Lawson (1937) that anol (*p*-hydroxypropenylbenzene) undergoes polymerisation to yield traces of a highly active œstrogenic substance. During the period devoted to the isolation and elucidation of the composition of this highly active polymer several dimerides of anol were synthesised. Of these the most potent was 4–4′-dihydroxy-*α*-*β*-diethyl stilbene, or stilbœstrol (Dodds, Goldberg, Lawson, and Robinson 1938). Several esters of this substance were prepared which were analogous to the corresponding esters of œstrone and œstradiol in physiological activity. It was found that the most prolonged activity was that of the dipropionate ; it was therefore decided to test this substance clinically. After intensive research Campbell, Dodds, and Lawson (1938) isolated the highly active polymer of anol, and this was found to be the hydrogenated form of stilbœstrol, in which the double bond between the two carbon atoms had been removed. This was termed hexœstrol and has the following formula :



It can be prepared synthetically in much better yields and by much simpler methods than by the polymerisation of anol. Thus, it can be obtained by the hydrogenation of stilbœstrol or by direct synthesis from anethole. Since the substance contains two asymmetric carbon atoms, it can exist either in a racemised form or in a meso form—i.e., either externally or internally compensated. The highly active hexœstrol, which is being investigated clinically, is thought to be the meso form, with a melting-point of 184° C.

CLINICAL TRIALS

Reports on the clinical effects of stilbœstrol were made to the Therapeutic Trials Committee of the Medical Research Council by Winterton and MacGregor (1939) and by Bishop, Boycott and Zuckerman (1939). The present communication is a similar report on stilbœstrol dipropionate and hexœstrol.

Effect of stilbœstrol dipropionate and hexœstrol in the menopausal syndrome and in atrophic conditions of the vagina.—In these cases the chief criteria of response were reduction in the daily hot-flush count, relief of symptoms, and improvement of the vaginal-smear picture (return of cornified cells) and of the condition of the vaginal mucosa. Of 66 cases in the menopausal series, 8 did not react to stilbœstrol dipropionate or to hexœstrol or to both. In the series of 36 cases of atrophic vaginitis 1 case did not respond either to the dipropionate or to hexœstrol. Thus, in 102 patients with subjective and/or objective menopausal manifestations relief was obtained in 93 (91·2 per cent.). Of the 60 cases treated with stilbœstrol dipropionate 6 (10 per cent.) did not respond. Of the 63 cases treated with hexœstrol 17 (27 per cent.) did not respond. The higher percentage of failures with hexœstrol was probably due to the relatively lower dosage (see tables I and II).

Effect of stilbœstrol dipropionate and hexœstrol on patients with amenorrhœa.—Treatment was given to 48 patients with amenorrhœa of various durations. Uterine hæmorrhage was induced in 28 by stilbœstrol dipropionate or by hexœstrol or by both. Of 31 cases treated with stilbœstrol dipropionate 9 did not respond ; nor did 20 out of the 27 cases treated with hexœstrol (see table III). These rather poor

* A clinical report to the Therapeutic Trials Committee of the Medical Research Council.

results are almost undoubtedly due to low dosage. Of the 20 failures with hexœstrol, for instance, 12 were treated with 0·25 mg. single doses. It was not our sole aim to obtain as high a percentage of success as possible, but we were also trying to determine the approximate threshold doses. It appears that, at any rate so far as amenorrhœa is concerned, it is unlikely that results will be obtained unless each dose is 1 mg. or more.

Effect of stilbœstrol dipropionate and hexœstrol in dysmenorrhœa and in checking lactation.—A small series of cases of dysmenorrhœa and of cases in which inhibition of lactation was required shows poor results in dysmenorrhœa and uniformly successful results in inhibiting lactation (see tables IV and V). Failure to relieve dysmenorrhœa was probably largely a question of dosage, although there is no record in some cases of the individual doses given.

TABLE I—MENOPAUSAL SYNDROME

		Stilbœstrol dipropionate		Hexœstrol		Stilbœstrol		Natural œstrogen		
		+	−	+	−	+	−	+	−	
Responsive to all	1	2:28*	..	2:28	..	1·5:21	..	..	..	Stilbœstrol dipropionate, hexœstrol and other œstrogens (5 cases)
Responding to natural œstrogens and S.D.	2	0·5:7	..	0·5:7	..	..	..	0·1:1·4	..	
	3	0·5:7	..	..	0·5:7	..	..	5:—	..	
	4	0·5:7	..	..	0·25:3·5	..	..	0·15:2·1	..	
Responding to S. but not S.D. and H.	5	..	1:14	..	1:14	1:14	..	..	..	
Responding to stilbœstrol dipropionate and natural œstrogens	6	2:84	..	..	..	..	..	?	..	Stilbœstrol dipropionate, and natural œstrogens (7 cases)
	7	1:84	..	..	..	1:—	..	0·5:—	..	
	8	1:28	(0·5:7)	..	..	..	..	5:—	..	
	9	1:28	..	..	..	1:—	..	3:—	..	
	10	1:28	..	..	..	..	..	0·3:—	..	
Responding to S.D. but not to other œstrogens	11	5:—	..	..	..	..	..	..	5:—	
	12	1:14	..	..	..	..	0·1:—	..	0·1:—	
Responding to hexœstrol and natural œstrogens	13	..	..	1:91	..	..	..	?	..	Hexœstrol and other œstrogens (8 cases)
	14	..	..	1:49	..	?	..	..	..	
	15	..	..	1:28	(0·25:3·5)	..	(1:14)	5:70	(1:14)	
	16	..	..	1:14	..	..	..	?	..	
	17	..	..	0·25:15	..	?	..	..	..	
Responding to natural œstrogens but not to hexœstrol	18	..	..	..	3:21	..	..	5:—	..	
	19	..	..	..	0·25:10·5	..	..	0·2—	..	
								0·6:—		
Responding to neither	20	..	..	..	0·25:10·5	..	1:28	..	0·1:14	
Responding to stilbœstrol dipropionate and hexœstrol	21	1:28	(0·5:7)	1:28	..	..	..	..	..	Stilbœstrol dipropionate and hexœstrol (11 cases)
	22	1:28	..	0·25:3·5	..	..	..	..	..	
	23	0·5:10·5	..	1:28 (fair)	..	..	..	..	..	
	24	0·5:10·5	..	1:28	(0·25:1·75)	..	..	..	..	
	25	0·5:7	..	0·25:1·75 (fair)	..	..	..	..	..	
	26	0·5:7	..	0·5:7	(0·25:1·75)	..	..	..	..	
Responding to stilbœstrol dipropionate but not to hexœstrol	27	1:42	..	..	0·75:10·5	..	..	..	..	
	28	1:14	..	..	1:14	..	..	..	..	
	29	0·5:21	..	..	0·75:10·5	..	..	..	..	
	30	0·5:21	..	..	0·75:10·5	..	..	..	..	
Responding to neither	31	..	1:—	..	0·75:10·5	..	..	..	..	
Responding to stilbœstrol dipropionate	32	1:30	..	..	..	..	..	..	..	Stilbœstrol dipropionate (17 cases)
	33	1:28	..	..	..	..	..	..	..	
	34	0·5:21	..	..	..	..	..	..	..	
	35	0·5:21	..	..	..	..	..	..	..	
	36	0·5:21	..	..	..	..	..	..	..	
	37	0·5:21	..	..	..	..	..	..	..	
	38	0·5:21	..	..	..	..	..	..	..	
	39	0·5:21	..	..	..	..	..	..	..	
	40	0·5:10·5	..	..	..	..	..	..	..	
	41	0·5:10·5	..	..	..	..	..	..	..	
	42	0·5:10·5	..	..	..	..	..	..	..	
	43	0·5:7	..	..	..	..	..	..	..	
	44	0·5:7	..	..	..	..	..	..	..	
	45	0·5:7	..	..	..	..	..	..	..	
	46	0·5:3·5	..	..	..	..	..	..	..	
Failure to respond to S.D.	47	..	0·5:10·5	..	..	..	..	..	..	
	48	..	0·1:0·7	..	..	..	..	..	..	
Responding to hexœstrol	49	..	..	5:20 (inj.)	..	..	..	..	..	Hexœstrol (18 cases)
	50	..	..	1·5:21	..	..	..	..	..	
	51	..	..	1·5:21	..	..	..	..	..	
	52	..	..	1·5:21	..	..	..	..	..	
	53	..	..	1·5:21	..	..	..	..	..	
	54	..	..	1·5:21	..	..	..	..	..	
	55	..	..	1:51	..	..	..	..	..	
	56	..	..	1:42	..	..	..	..	..	
	57	..	..	1:42	..	..	..	..	..	
	58	..	..	1:42	..	..	..	..	..	
	59	..	..	1:42	..	..	..	..	..	
	60	..	..	1:15	..	..	..	..	..	
	61	..	..	1:14	(0·25:1·75)	..	..	..	..	
	62	..	..	1:14	..	..	..	..	..	
	63	..	..	0·75:10·5	..	..	..	..	..	
	64	..	..	0·25:20	..	..	..	..	..	
	65	..	..	0·25:20	..	..	..	..	..	
Failure to respond to hexœstrol	66	..	..	..	0·75:10·5	..	..	..	..	
		36	4	30	12	6	2	13	3	

Chief criteria of response are reduction in daily hot-flush count, and relief of symptoms. Observations have been made in some cases on the vaginal smear.

* The first figure indicates the size of the single dose, and the second the total dosage of a course.

S = Stilbœstrol.

SD = Stilbœstrol dipropionate. H = Hexœstrol.

Stilbœstrol dipropionate and hexœstrol were administered by mouth unless stated to the contrary.

Comparative potency.—Opportunity for comparison of relative potency of these preparations and of stilbœstrol and the natural œstrogens is limited, and it would be unwise to draw conclusions from these results. It is not the object of this investigation to make these comparisons. Such a task would best be accomplished by careful observation of a few patients with easily defined degrees of ovarian deficiency submitted to suitably chosen doses; 155 cases of the present series. Of these, 23 showed toxic symptoms with stilbœstrol dipropionate or with hexœstrol or with both (14·8 per cent.). Altogether in these 155 cases 252 courses have been given, toxic effects being noted in 26 (10·3 per cent.). Table VI shows that the toxicity-incidence of stilbœstrol dipropionate is about five times as much as that of hexœstrol and roughly about the same as that of stilbœstrol. None of us has recorded serious

TABLE II—ATROPHIC VAGINITIS

		Stilbœstrol dipropionate		Hexœstrol		Stilbœstrol		Natural œstrogen		
		+	−	+	−	+	−	+	−	
Responding to S.D. and natural œstrogens but not to H.	1	1:42	..	..	2:28	..	1:14	0·3:84	..	S.D., H., and other œstrogens (1 case)
Responding to S.D. and natural œstrogens	2	5:70	..	..	..	..	5:70	1:14	..	Stilbœstrol dipropionate and other œstrogens (3 cases)
	3	2:60	..	..	..	..	..	5:90 (inj.)	..	
	4	2:28	(0·5:7)	..	..	2:28	..	..	..	
Responding to hexœstrol and other œstrogens	5	..	..	1:28	..	1:28	..	..	5:1 (inj.)	Hexœstrol and other œstrogens (3 cases)
	6	..	..	0·25:3·5	..	1:42	..	1:14	..	
Responding to S. but not to hexœstrol	7	..	..	..	1:14	..	5:70	..	..	
Responding to S.D. but not to H.	8	1:42	..	..	0·25:10·5	..	..	..	..	Stilbœstrol dipropionate and hexœstrol (4 cases)
	9	0·5:31·5	..	..	0·25:10·5	..	..	..	..	
	10	0·5:21	..	..	0·25:10·5	..	..	..	..	
Responding to H. but not to S.D.	11	..	1:14	1:28	..	..	..	..	..	
Responding to stilbœstrol dipropionate	12	5:150	..	..	..	..	..	..	..	Stilbœstrol dipropionate (12 cases)
	13	1:28	..	..	..	..	..	..	..	
	14	1:14	..	..	..	..	..	..	..	
	15	0·5–1:105	..	..	..	..	..	..	..	
	16	0·5–1:63	..	..	..	..	..	..	..	
	17	0·5–1:63	..	..	..	..	..	..	..	
	18	0·5:63	..	..	..	..	..	..	..	
	19	0·5:42	..	..	..	..	..	..	..	
	20	0·5:42	..	..	..	..	..	..	..	
	21	0·5:42	..	..	..	..	..	..	..	
	22	0·5:42	..	..	..	..	..	..	..	
Failure to respond to S.D.	23	..	5:90	..	..	..	..	..	..	
Responding to hexœstrol	24	..	..	5:100	..	..	..	..	..	Hexœstrol (13 cases)
	25	..	..	5:75	..	..	..	..	..	
	26	..	..	3:63	..	..	..	..	..	
	27	..	..	3:42	..	..	..	..	..	
	28	..	..	3:42	..	..	..	..	..	
	29	..	..	3:35	..	..	..	..	..	
	30	..	..	1:28	..	..	..	..	..	
	31	..	..	1:18	..	..	..	..	..	
	32	..	..	1:14	..	..	..	..	..	
	33	..	..	0·25:21	..	..	..	..	..	
	34	..	..	0·25:21	..	..	..	..	..	
	35	..	..	0·25:10·5	..	..	..	..	..	
	36	..	..	0·25:3	..	..	..	..	..	
		18	2	16	5	3	3	4	1	

Criteria of response are similar to those used in the menopausal series plus objective signs of improvement of the atrophic condition of the vaginal mucosa. (Symbols as in table I.)

response to these could be recorded by such objective signs as induction of uterine hæmorrhage in ovariectomised subjects, which would provide indicators with a clear-cut end-point. Of the present series 5 cases responded to stilbœstrol dipropionate but not to an identical dose of hexœstrol; 1 case responded to stilbœstrol dipropionate but not to similar dosage of œstradiol benzoate; and, finally, 1 case which responded to the dipropionate did not respond to a similar course of stilbœstrol, though, on the other hand, 3 cases compared unfavourably when treated with the dipropionate as opposed to stilbœstrol.

Toxicity.—There have been many published reports of toxic symptoms, such as nausea, vomiting, and even jaundice, following treatment with synthetic œstrogens, though seldom if ever after treatment with natural œstrogens. This was discussed in our papers on stilbœstrol (Winterton and McGregor 1939, Bishop, Boycott, and Zuckerman 1939). We have studied the incidence of toxic by-effects among by-effects; they have usually been only transient and mild, such as nausea and occasionally vomiting and constipation.

TOXIC SYMPTOMS ASSOCIATED WITH ADMINISTRATION OF SYNTHETIC ŒSTROGENS (Dr. Bishop)

Apart from the foregoing description of the combined results obtained by the joint authors, it seems appropriate to record separately and to analyse more fully a series I observed alone. In this small series stilbœstrol was given to 83 patients, stilbœstrol dipropionate to 20, and hexœstrol to 18. The total number of patients receiving synthetic œstrogens was 96. Toxic symptoms developed in 21 patients out of 96 receiving synthetic œstrogens; in 19 out of 83 patients receiving stilbœstrol; in 6 out of 20 receiving stilbœstrol dipropionate; and in none of the 18 patients receiving hexœstrol. In so few cases were the synthetic œstrogens given by injection that I am not in a position to compare

TABLE III—AMENORRHŒA

		Stilbœstrol dipropionate		Hexœstrol		Stilbœstrol		Natural œstrogen		
		+	−	+	−	+	−	+	−	
Responsive to all	1	1:28	..	1:42	(1:28)	..	..	3:12 (inj.)	..	S.D., H., and other œstrogens (3 cases)
Responding to natural œstrogens and S.D.	2	1:42	..	..	1:42	..	..	3:12 (inj.)	..	
Responding to natural œstrogens	3	..	0·5:14	..	0·25:10·5	..	..	3:12 (inj.)	..	
Responding to stilbœstrol dipropionate and natural œstrogens	4	10:10	..	..	..	..	..	5:20 (inj.)	..	Stilbœstrol dipropionate and other œstrogens (12 cases)
	5	(inj.)								
	6	5:150	..	..	..	..	..	..	?	
		5:150	..	..	..	..	..	?	..	
	7	5:150	..	..	..	..	..	?	..	
	8	1:42	..	..	..	..	..	3:12 (inj.)	..	
	9	1:42	(1:28)	..	..	..	..	2:8 (inj.)	..	
	10	1:35	..	..	..	..	..	?	..	
	11	1:28	..	..	..	..	..	3:12 (inj.)	..	
Response to other œstrogens—not to S.D.	12	..	10:10	..	..	5:70	..	5:25 (inj.)	..	
	13	..	(inj.) 5:150	..	..	..	..	?	..	
Response to neither	14	..	1:18	..	..	2:56	..	..	..	
	15	..	1:14	..	..	..	1:14	..	..	
Response to H. and other œstrogens	16	..	..	1:30	..	5:20 (inj.)	..	..	..	Hexœstrol and other œstrogens (5 cases)
	17	..	..	1:28	..	..	..	2:10 (inj.)	..	
Response to natural œstrogens but not to H.	18	..	..	..	0·25:4 (inj.)	..	..	5:25 (inj.)	..	
	19	..	..	..	1:10	1:14	..	5:5 (inj.)	..	
Response to neither	20	..	..	..	2:28	..	..	..	5:25 (inj.)	
Response to stilbœstrol dipropionate but not to hexœstrol	21	1:42	..	..	0·25:10·5	..	..	..	..	Stilbœstrol dipropionate and hexœstrol (7 cases)
	22	1:42	..	..	0·25:10·5	..	..	..	..	
	23	1:28	..	..	1:28	..	..	..	..	
	24	0·5:25	..	..	0·25:10·5	..	..	..	..	
	25	0·5:15	..	..	0·25:10·5	..	..	..	..	
Response to neither	26	..	1–1·5:105	..	1:28	..	..	..	..	
	27	..	1:28	..	1:42	..	..	..	..	
Response to stilbœstrol dipropionate	28	10:10 (inj.)	..	..	..	..	..	..	..	Stilbœstrol dipropionate only (9 cases)
	29	5:150	(5:20)	..	..	..	..	..	..	
	30	5:150	..	..	..	..	..	..	..	
	31	1:42	..	..	..	..	..	..	..	
	32	1:28	..	..	..	..	..	..	..	
	33	1:14	..	..	..	..	..	..	..	
	34	0·5:21	..	..	..	..	..	..	..	
Failure to respond to S.D.	35	..	10:300	..	..	..	..	..	..	
	36	..	1:28	..	..	..	..	..	..	
Response to hexœstrol	37	..	..	2:60	..	..	..	..	..	Hexœstrol only (12 cases)
	38	..	..	1:36	..	..	..	..	..	
	39	..	..	1:14	..	..	..	..	..	
	40	..	..	0·25:7	..	..	..	..	..	
Failure to respond to hexœstrol	41	..	..	..	5:50	..	..	..	..	
	42	..	..	..	2:98	..	..	..	..	
	43	..	..	..	1:28	..	..	..	..	
	44	..	..	..	1:28	..	..	..	..	
	45	..	..	..	0·25:10·5	..	..	..	..	
	46	..	..	..	0·25:10·5	..	..	..	..	
	47	..	..	..	0·25:10·5	..	..	..	..	
	48	..	..	..	0·25:10·5	..	..	..	..	
		22	9	7	20	4	1	15	2	

The sole indicator of response is induction of uterine hæmorrhage. (Symbols as in table I.)

the incidence of toxic symptoms when the material is given by injection with the effects of its oral administration. Subsequent observations refer exclusively to oral administration, unless special mention is made of parenteral administration.

Stilbœstrol.—An analysis has been made of the single and total dosage per course of those cases treated with stilbœstrol. The average single dose associated with toxic symptoms is 3 mg. as compared with an average single dose of 2·3 mg. where toxic symptoms did not appear. The average total dosage of all subjects receiving stilbœstrol was 106·5 mg., and of those who showed no toxic symptoms 96·2 mg., as compared with 139·2 mg. in those cases where toxic symptoms developed. The average total dosage of a single course of stilbœstrol in cases showing no toxic symptoms was 39 mg., whereas the average total dose of single courses associated with toxic symptoms was 81 mg. From these figures it appears that the size of the dose may be an important factor in the production of toxic symptoms. Further analysis of the 19 cases showing toxic symptoms with stilbœstrol reveals that in 1 case only did the toxic symptoms continue throughout the period of administration (two fourteen-day courses of 1 mg. were administered); in 8 cases one course only was

TABLE V—INHIBITION OF LACTATION

		Stilbœstrol dipropionate		Hexœstrol	
		+	−	+	−
Responding to stilbœstrol dipropionate (4 cases)	1	5:20–30	..	..	..
	2	5:20–30	..	..	..
	3	5:20–30	..	..	..
	4	5:20–30	..	..	..
Responding to hexœstrol (5 cases)	5	..	..	6:—	..
	6	..	..	1:15	..
	7	..	..	1:14	..
	8	..	..	1:9	..
	9	..	..	1:7	..
		4		5	

Forty-five further cases were successfully treated, but details of dosage are not available.

TABLE IV—DYSMENORRHŒA

		Stilbœstrol dipropionate		Hexœstrol		Stilbœstrol		Natural œstrogen		
		+	−	+	−	+	−	+	−	
Response to other œstrogens but not to S.D. or H.	1	..	2·5:35	..	1:14	..	..	5:25 (inj.)	..	S.D., H., and other œstrogens (2 cases)
	2	..	2:28	..	1:14	2:28	..	5:25 (inj.)	..	
Responding to S.D. but not to S.	3	5:75	..	..	..	..	5:25	..	..	S.D. and other œstrogens (4 cases)
Responding to other œstrogens but not to S.D.	4	..	5:25	..	..	5:50	..	5:15 (inj.)	..	
	5	..	1;14	..	..	1:14	..	..	..	
Responding to neither	6	..	1:14	..	..	..	1:14	..	..	
Responding to H. and natural œstrogens	7	..	..	0·5:5	..	..	..	1:10	..	H. and other œstrogens (3 cases)
Responding to S. but not to H.	8	..	..	..	0·5:7	1:14	..	..	..	
Responding to neither	9	..	..	..	1:14	..	2:14	..	5:25	
Responding to S.D. but not to H.	10	—:30	..	..	—:1·5	..	..	..	..	S.D. and H. (1 case)
Responding to S.D.	11	—:60	..	..	..	..	..	..	..	Stilbœstrol dipropionate (5 cases)
	12	—:45	..	..	..	..	..	..	..	
Failure to respond to S.D.	13	..	—:150	..	..	..	..	..	..	
	14	..	—:60	..	..	..	..	..	..	
	15	..	1:14	..	..	..	..	..	..	
Responding to H.	16	..	..	—:60	..	..	..	..	..	Hexœstrol (3 cases)
Failure to respond to H.	17	..	..	..	—:60	..	..	..	..	
	18	..	..	..	—:12	..	..	..	..	
		4	8	2	7	4	3	4	1	

The indicator of response is relief of pain.

administered and toxic symptoms were experienced during this course ; in the remaining 10 cases toxic symptoms developed in association with only some of the courses. In 6 of these cases the toxic symptoms developed with the higher but not with the lower doses. In 2 the symptoms were associated with the lower but not with the higher doses. From these figures the following observations may be made :—

(1) Toxic symptoms are more likely to develop when high doses are given.

(2) There may be a personal idiosyncrasy to stilbœstrol.

(3) Toxic symptoms tend to appear early in treatment and to be overcome if treatment is persisted in.

Stilbœstrol dipropionate was given to 20 patients and 6 of them showed toxic symptoms. Of those showing toxic symptoms 2 out of 13 showed these symptoms both with stilbœstrol and its ester ; 4 showed symptoms with stilbœstrol but not with the dipropionate ; and 2 showed symptoms with the dipropionate but not with the pure synthetic œstrogen. There is no reason to suppose, from these observations, that stilbœstrol dipropionate is any less toxic than stilbœstrol.

Hexœstrol was administered to 18 patients. No toxic symptoms developed. The doses were comparatively low, the highest single dose being 2 mg.

TABLE VI—INCIDENCE OF TOXIC EFFECTS

	Number and per cent.
Cases in which presence or absence of toxic effects has been noted	155
Toxic effects present in	23 (14·8)
Courses given in which presence or absence of toxic effects has been noted	252
Toxic effect present in	26 (10·3)
Cases treated with stilbœstrol dipropionate	93
Toxic effects present in	20
Courses of stilbœstrol dipropionate given	132
Toxic effects present in	22 (16·6)
Cases treated with hexœstrol	89
Toxic effects present in	4
Courses of hexœstrol given	120
Toxic effects present in	4 (3·3)
Cases treated also with stilbœstrol	22
Toxic effects due to stilbœstrol present in	6
Courses of stilbœstrol given	77
Toxic effects present in	6

SUMMARY

Stilbœstrol dipropionate and hexœstrol have œstrogenic properties similar to those of stilbœstrol, in so far as they are capable of the following actions :—

(1) inducing uterine hæmorrhage in cases of amenorrhœa ;

(2) relieving the symptoms of the menopausal syndrome ;

(3) leading to the appearance of cornified cells in the vaginal smear in menopausal cases ;

(4) restoring the normal condition of the vulva and vagina in senile atrophic vaginitis ;

(5) relieving the pain of dysmenorrhœa ;

(6) inhibiting lactation.

Toxic effects, though not in our experience severe, developed in 21·6 per cent. of cases treated with stilbœstrol dipropionate and in 4·5 per cent. of cases treated with hexœstrol.

The stilbœstrol dipropionate used in these investigations was supplied by British Drug Houses, Ltd., and by Boots Pure Drug Co., Ltd. ; the hexœstrol was supplied by the latter firm.

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PNEUMOCOCCAL PAROTITIS
AND ANTECEDENT AURICULOTEMPORAL SYNDROME

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This case is reported to illustrate two different types of pyogenic parotitis, one of which was followed by a rare complication. The earlier parotitis, on the left side, was staphylococcal and followed by an auriculotemporal syndrome, whereas the second attack of parotitis, on the right side, was pneumococcal. The case is reported primarily from the point of view of the auriculotemporal syndrome, which is an unusual complication of acute parotitis and the only one of this type which has come under my care. At the same time, the case shows the extreme susceptibility of the patient to parotid infections and illustrates some of the main differences between staphylococcal and pneumococcal parotitis.

RIGHT PNEUMOCOCCAL PAROTITIS

The patient, a woman aged 60, came under observation in August, 1937, because of a right-sided acute parotitis. Some two years previously she had had a rather obscure pulmonary infection, with moderate fever, cough, and asthmatic attacks, probably bronchitis or low-grade bronchopneumonia. She said that it had cleared up with a pneumococcal vaccine. About the time of this illness she began to have sudden intermittent swelling of the left parotid. On the first occasion this happened during influenza, but the other attacks had come on during her usual health. The attacks always came on suddenly, had no relation to meals, and never lasted more than an hour. The last attack took place twelve days before the patient came under observation. During the previous year there had been a small swelling behind and below the angle of the jaw on the right side, which was thought to be due to a tonsillar gland. The patient, however, said that this swelling was not persistent, but also came and went. Thirteen days before coming under my care she developed a sudden swelling of the whole of the right parotid region; this persisted and became very painful, and three days later she could hardly open her mouth. There was fever up to 100° F. The swelling and pain varied somewhat from day to day.

Past history.—The patient had never enjoyed very good health but had led an active life. A nævus of the right cheek and parotid region had been treated many times with surface radium. Mumps in childhood had involved both parotids. The appendix had been removed thirty years previously. Shortly after this the patient had had a severe left-sided parotitis with abscess after influenza. She was desperately ill, there were long periods of unconsciousness, and she was thought to be dying. As a last resort, a small incision was made over the lower part of the parotid without anæsthesia and a large abscess evacuated. From the pus *Staphylococcus aureus* was grown. The rest of the relevant details in this connexion are considered in the section dealing with the auriculotemporal syndrome (see below). All the teeth had been removed many years ago. Twenty years previously the left ovary had been removed because of a cystic condition.

Physical signs.—On August 24, 1937, the patient was very exhausted, ill-looking, dusky complexioned, and obviously in great pain. The temperature had never exceeded 100° F. and the pulse was raised proportionately. The right parotid was moderately enlarged, the maximal swelling being over the angle of the jaw. The overlying skin was shiny and slightly reddened, and there was a trace of œdema. Evidence of the old nævus was present, together with some scarring. The region of the angle of the jaw was exquisitely tender, and there was tenderness over the whole gland. No pus could be expressed through the right parotid duct. The other salivary glands and their ducts and orifices were normal, and the mouth was edentulous and dry. Next day the right parotid duct was catheterised and a small amount of thick tenacious yellowish pus obtained. Cultures of this produced a pure growth of type II pneumococcus.

Course and treatment.—Heat was applied locally with hot-water bottles, and hot mouth-washes were given repeatedly. A 1 in 10,000 solution of Optochin hydrochloride was also used as a mouth-wash twice a day. The gland was massaged for 5 min. each day to empty the ducts of thick tenacious yellowish secretion. After two days' treatment the swelling had practically disappeared, the pus was much less tenacious and was pouring freely into the mouth, the pain was lessened, and the general condition was much improved. Throughout this period the patient was kept on a diet as solid as possible to stimulate the flow of saliva.

By Sept. 3 the condition had practically cleared up. Three days later, however, there was a recurrence of local swelling, increase in local pain, and diminution of discharge along the duct. This necessitated repeated catheterisation of the duct. Gradually the condition subsided, and by the 30th there was no obvious swelling of the parotid, but the anterior border of the gland was just palpable. The orifice of the duct was still a little dilated but not inflamed, and the saliva was still diffusely turbid but contained no large flakes of mucopus.

Subsequently the condition caused no further anxiety, and the patient did not come under observation again till December, 1938. She had remained well in the intervening period, and there had been no further trouble with the right parotid. A catheter specimen of the secretion of the right parotid was copious and clear. Culture produced no pneumococci, but there were a few colonies of staphylococci of the aureus and albus types.

LEFT AURICULOTEMPORAL SYNDROME

The patient reported that, after the left parotid abscess had been drained thirty years previously, the wound had discharged for about four months. There was no evidence that the discharge was parotid secretion. For many weeks after operation a left-sided facial paralysis affected the eye and the mouth. Ever since the wound had healed there had been redness and sweating of the left side of the face, involving the temporal and zygomatic regions, on eating. Shortly after the operation the affected region always became bluish on eating. For some time after operation the moisture would trickle down over the cheek and drip off the face, and for some time the patient could not take meals in company. At the present time this moisture is produced particularly with acid foods and with foods the patient likes. During a typical meal the face has to be mopped usually during the second course and again at the end, but there is no longer enough moisture to trickle off the face.

Physical signs.—On Dec. 9, 1938, there was no obvious abnormality on the left side of the face or cheek, apart from a small scar in the lower part of the parotid region. Sensation was slightly impaired in the area supplied by the auriculotemporal nerve and on the side of the face as far as the outer canthus and the upper part of the cheek to about 1 in. below the zygoma. The left parotid gland was not palpable, the orifice of the duct was patent, and secretion could be expressed into the mouth by massage. In the mouth there were many raised pearly white patches of lichen planus.

The patient was given a piece of lemon to suck. Within a few seconds the skin of the affected region became definitely reddened, and minute beads of moisture appeared on the surface. The reddened

area seemed to be mainly a broad band about 1½ in. wide, passing backwards and slightly downwards from the outer part of the eye towards the upper part of the ear. This area almost gave the impression of having a slightly raised edge, and extended just into the hair. The area from which the moisture was coming seemed to extend rather more widely than the area of the hyperæmia. The patient was not conscious of any unusual sensations in the affected area. Within 10 min. of the cessation of the stimulus the sweating had ceased and the skin had returned to a normal colour. No changes were noted in the pupils.

COMMENT

This case corresponds closely to most of the reported cases of the auriculotemporal syndrome. I have not made an exhaustive study of all the reported case-histories of this condition, but I am not aware of any report of a case in which the characteristic phenomena were observed so late as thirty years after the original parotid lesion. In the present instance the sweating had gradually diminished but could still be readily elicited, and was sufficiently troublesome to require mopping twice during every meal. The patient would not submit to more detailed experiments.

THE AURICULOTEMPORAL SYNDROME

The auriculotemporal syndrome is well recognised but rare. It is also called Frey's syndrome or local hyperhidrosis of the face. The term "auriculotemporal syndrome" is the most descriptive, because the phenomena are almost always present in the area supplied by the auriculotemporal nerve, though in some cases they may extend to areas supplied by neighbouring nerves.

The condition was extensively studied by Frey (1923), who reviewed some of the earlier reports. Trioumphoff reported 14 cases to the Russian Congress of Neurologists in 1924 and surveyed the subject again in 1926. In all his cases there was an antecedent history of suppurative parotitis. Many other cases have been reported by Vaughan (1925), Kaminsky (1929), Fridberg (1931), Bassoe (1932), and Lemaitre and Baudouin (1934). Wilson (1936) has considered the phenomena in connexion with the innervation of the sweat glands of the face, and Ford and Woodhall (1938) in connexion with misdirection of regenerating fibres of cranial, spinal, and autonomic nerves.

Ætiology.—The auriculotemporal syndrome may follow injury to the parotid or its immediate vicinity, but most of the cases are sequelæ of suppurative parotitis. The parotitis has usually been severe and has either necessitated drainage or has ruptured spontaneously. In cases of this type reported from Poland and Russia the parotitis has generally been secondary to either typhus or typhoid fever. This fact suggests that the *Staphylococcus aureus* has most likely been the infecting organism. Cases have also been reported following gunshot wounds in the region or even after the surgical removal of a mixed parotid tumour. In a few cases the condition has developed in syringomyelia. Some of the cases which have been secondary to a local parotid lesion have been associated with either a temporary or a permanent facial paralysis.

Area of involvement.—The characteristic phenomena are seen in the area supplied by the auriculotemporal nerve and to a less extent in the area supplied by the third division of the fifth nerve and by the great auricular nerve, all of which nerves traverse the substance of the parotid gland in the course of their peripheral distribution.

Clinical features.—All the writers emphasise that the symptoms of the auriculotemporal syndrome develop not at the time of the original parotid lesion but during convalescence some weeks or even months later. In one case (Bassoe 1932) the condition developed three years after a suppurative parotitis. The characteristic phenomena consist of hyperæmia and sweating in the affected area, which develop in response to eating and are initiated by a taste reflex from the posterior third of the tongue. At times the sweating may be sufficient for the moisture to trickle off the face and cause serious embarrassment to the patient. Some of the patients also get tingling or even pain, which precedes the redness and sweating. There are considerable variations in the size of the affected areas, but in all cases the area supplied by the auriculotemporal nerve is involved. For each patient, however, the area of involvement remains constant. Changes in the size of the pupil have been noted in some cases, and others have shown sensory disturbances in the affected areas.

Mechanism.—The evidence suggests that the auriculotemporal syndrome is a reflex from taste stimuli from the posterior third of the tongue. Chewing a tasteless substance, such as wood, does not induce the phenomena. In some normal people hyperæmia and sweating of the face may follow the eating of certain foods, especially spiced ones. The face is a region where vasomotor phenomena are conspicuous. The auriculotemporal nerve contains, besides its sensory fibres, vasodilator fibres from the cervical sympathetic to the blood-vessels of the skin and secretory fibres which are motor to the sweat glands. Further, for a short part of its course it also contains secretory and vasodilator fibres to the parotid gland, which are derived from the ninth nerve through the otic ganglion. Ford and Woodhall (1938) summarise the position as follows:—

> "It is evident, therefore, that when the nerve is injured between the parotid gland and the point at which it receives its communication from the ninth nerve the various groups of nerve fibres enumerated may be severed, and in the process of regeneration may become misdirected along pathways other than those they originally pursued. It seems probable that the auriculotemporal syndrome is the result of misdirection of some of the secretory fibres of the parotid gland so that they form connections with the sweat glands and blood-vessels of the skin. As a result, when the patient is eating and a volley of nervous impulses passes over the parotid fibres, paroxysmal sweating and vasodilatation occur in the distribution of the auriculotemporal nerve."

Ford and Woodhall (1938) also suggest that the condition is always preceded by division of the auriculotemporal nerve; that initially there is an area of anæsthesia which corresponds to the area supplied by the auriculotemporal nerve; and that the typical phenomena which develop sometime later appear after the nerve has regenerated. This point is not sufficiently brought out in the available case-records. Certainly the pain which some patients get, particularly in the early days after the development of the condition, supports the view of division of the nerve. It is not necessary, however, to postulate complete division of the auriculotemporal nerve, for an inflammation might be severe enough to destroy some of the parotid secretory fibres, and during regeneration some of these fibres might become misdirected and join vasomotor or sweat fibres in the auriculotemporal nerve. The evidence thus suggests that the auriculotemporal syndrome is a reflex initiated by a taste stimulus from the posterior third of the tongue, passing through normal reflex channels but in part diverted from these as the result of

abnormal communications between parotid secreting fibres and vasomotor and sweat fibres in the auriculotemporal nerve due to antecedent injury or inflammation. Briefly, it is due to faulty regeneration of parotid secreting fibres.

Wilson (1936) has shown that the sweat glands of the face have a double nerve-supply: the sympathetic fibres and accessory fibres. The sympathetic secretory fibres leave the carotid plexus and join the peripheral branches of the trigeminal nerve, probably extracranially. These are distributed with the trigeminal branches and not with the periarterial nerves. The accessory secretory fibres probably arise from the brain stem and join the trigeminal nerve at some point distal to its sensory root. These too are distributed with the trigeminal branches. Although they supply the sweat glands of the face, there is no evidence that they play any important part in sweating under normal conditions, and their importance in relation to the auriculotemporal syndrome has still to be determined.

Prognosis.—Few of the reported cases have been followed over a long period of time or seen many years after the onset of the condition. Trioumphoff (1926) followed some of his cases up to five years; in 1 case only was there complete recovery at the end of three years, and in all the other cases the condition persisted without appreciable alteration. In my case reported here the condition had been present for thirty years, during which time the sweating had diminished and perspiration no longer ran off the face during meals, but it still developed during eating and could readily be evoked by eating lemon.

Treatment.—Few observations exist relating to the therapy of this condition. In Frey's case (1923) another physician suggested the injection of alcohol into the facial nerve, although there was no facial palsy. In this attempt he failed, but he apparently injected the auriculotemporal nerve, because the characteristic symptoms disappeared temporarily. Avulsion of the auriculotemporal nerve has been tried in a few cases, but there are few accurate records of this. Trioumphoff (1926) showed that atropine in ordinary doses had no effect on the condition. In 1 of his cases, where the sweating was confined to the great auricular nerve, division of this nerve relieved the symptoms.

SUMMARY

(1) A case of auriculotemporal syndrome is reported in a patient who came under observation for acute pneumococcal parotitis on the opposite side.

(2) The auriculotemporal syndrome had developed a few months after a serious suppurative parotitis, which had complicated influenza thirty years previously.

(3) The typical symptoms of local hyperæmia and sweating on eating had persisted ever since.

(4) For many years the degree of sweating was severe and sweat poured off the face during eating. When the patient came under observation, the hyperæmia and sweating were still both readily induced by eating or by taste stimuli, but the sweating was not so c ous as formerly.

(5) The auriculotemporal syndrome typically follows a severe attack of suppurative parotitis or less often injury to the parotid and occasionally develops during syringomyelia. The cases secondary to parotitis are by far the most numerous.

(6) The area of involvement is that of the distribution of the auriculotemporal nerve, and at times includes that of the third division of the trigeminal nerve and of the great auricular nerve, all of which traverse the parotid gland.

(7) The characteristic phenomena are described.

(8) The evidence suggests that the phenomena are reflex and result from the establishment of connexions between parotid secretory fibres of the auriculotemporal nerve and vasomotor and sweat secretory fibres running with the same nerve. These abnormalities may follow division of the nerve or be secondary to inflammation.

(9) The condition usually persists, though complete recovery has been reported. In the case here described the symptoms were still present after thirty years though less severe than originally.

(10) The possible lines of treatment are briefly described.

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BLOOD-UREA AND UREA CLEARANCE

BEFORE AND AFTER THE ADMINISTRATION OF UREA BY MOUTH

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IT is well known that the vast reserve power of the kidneys renders accurate assessment of their efficiency difficult. From the earliest days of clinical biochemistry, therefore, there has been an almost continual succession of tests leading to improved methods of measuring the functional capacity of these organs. The number and variety of tests to estimate renal efficiency are too extensive to mention here, but the most outstanding of recent times are the Van Slyke urea-clearance test and Fowweather's modification of this.

The original work of Van Slyke (Möller et al. 1928) is by this time so well known that a detailed reference to it here is superfluous, but certain aspects of his test deserve critical mention. Van Slyke's mathematical formula, which expresses the number of c.cm. of blood cleared of urea per minute, was based on the findings of only a few normal subjects. Multiple observations were made on these subjects, and the published results show that a considerable degree of variation of clearing power was displayed by each person.

As an example, eleven identical tests were carried out on one person and gave results ranging from 48 to 76 c.cm. of blood cleared of urea per minute, which in terms of normal average of the whole series—i.e., 54 c.cm. per minute—can be expressed as 91–141 per cent. of normal. An isolated low value of 48 per cent. of normal was obtained in one test on another subject, a result which was omitted by Van Slyke in his calculation of the mean urea clearance. Apart from this the extreme ranges were 63–141 per cent. of the mean.

This great variability of the urea clearance, as calculated on the basis of the Van Slyke technique, has been generally observed, and, what is a still more serious criticism, unusually low values have often

been noted in spite of rigid adherence to the principles of the test. These failings are discussed in detail by Fowweather (1934 a, b), who was the first to advocate estimation of the kidneys' clearing capacity after the ingestion of urea. He claims that his procedure gives more accurate results, and he substantiates this by comparing the clearance values before and after urea. His figures indicate a narrower range of variation in his normal subjects and the disappearance of the apparently unjustifiably low values. It is presumed that, at the higher levels of blood-urea obtaining in his test, the kidneys are stimulated to work at about their maximal capacity. Fowweather discusses a fundamental difficulty of the clearance test—i.e., the possibility of error due to incomplete emptying of the bladder—and maintains that this is likely to be minimised by the diuretic action of the ingested urea. The technique applied by Fowweather resembles the de Wesselow and Maclean concentration test.

An ordinary light breakfast with a limited fluid intake (coffee being strictly forbidden) is permitted. A timed specimen of urine is collected during the hour immediately preceding ingestion of 15 g. of urea in 200 c.cm. of water. Afterwards accurately timed specimens of urine are collected at the end of one and two hours. Further, blood is taken just before urea is given and again shortly before the last specimen of urine is voided. This makes it possible to calculate the urea clearance before and after the ingestion of urea.

Fowweather was prompted to utilise the second hour period after urea for his test, because he observed that of thirty-three normal subjects, in whom he estimated the blood-urea nitrogen at the end of the first and second hour after urea, twenty-six showed differences of less than 5 mg., four of 5–10 mg., and three of slightly over 10 mg. per 100 c.cm. of blood. Others have followed the blood-urea response subsequent to administration of urea by mouth (King 1928, Penington 1938), but in no instance has a sufficiently detailed study been made to justify the claim that a satisfactory degree of stability of blood-urea exists during the second hour after a 15 g. dose.

The routine application of Fowweather's test during the last four years has left us with no doubts that his modification yields much more accurate indications of renal efficiency than are obtainable from the original Van Slyke technique. We thought, however, that a closer scrutiny of the changes in the blood-urea and renal output after administration of urea by mouth may yield results not only of academic interest but also of practical value.

INVESTIGATION

Fifty healthy members of the hospital staff, aged 20–35, were investigated. In no instance was there raised blood-pressure (systolic not more than 130 mm. Hg, diastolic not more than 85 mm. Hg) or any abnormality in the urine; none had any history of renal disease. The blood was analysed by a modified Van Slyke and Cullen micro method.

A light breakfast of fruit and bread and butter with one small cup of tea was allowed approximately two hours before the test was due to begin. At about 8.30 A.M. the subject was instructed to empty the bladder, to note the time carefully, and to discard the specimen. At about 9.30 A.M. a specimen of blood was obtained and the bladder again emptied; these two specimens were used for the estimation of the Van Slyke urea clearance. Immediately afterwards 15 g. of urea in 200 c.cm. of water was given, and after this samples of blood were taken at ¼ hr., ½ hr., 1¼ hr., 1½ hr., and 2¼ hr., and the bladder was emptied as completely as possible at ½ hr., 1 hr., 1½ hr., 2 hr., and 2½ hr.

Analysis of this material enabled us to measure the urea clearance before the ingestion of urea; to construct blood-urea curves after the ingestion of urea; to calculate the urea clearance for each half-hourly period after the ingestion of urea; and to tabulate the data of urea concentration in urine for the 2½ hr. period of the experiment.

FINDINGS

Urea clearance before the ingestion of urea by mouth was calculated from samples of urine collected in a period of approximately an hour. The time varied according to the convenience of the subject, but in each case the exact number of minutes was carefully noted. Our results are stated in percentages of the accepted Van Slyke average normal levels—i.e., standard clearance of 54 c.cm. of blood per minute, when the volume of urine is less than 2 c.cm. per minute, and maximal clearance of 75 c.cm. of blood per minute, when the volume of urine exceeds 2 c.cm. per minute. The lowest value obtained was 33 per cent. and the highest 125 per cent. of normal. That this low finding was not an isolated instance can be seen from table I, where the results are grouped in grades differing by 10 per cent.

TABLE I—UREA CLEARANCE BEFORE INGESTION OF UREA

Percentage of Van Slyke normal level	Subjects	Percentage of Van Slyke normal level	Subjects
31–40	3	81–90	5
41–50	7	91–100	4
51–60	4	101–110	4
61–70	5	111–120	8
71–80	9	121–130	1

Blood-urea curves.—The frequent sampling of blood after ingestion of urea enabled us to obtain a curve for each of our subjects. We examined these curves from the points of view of the original level of the blood-urea, the maximal elevation and the time taken for this peak to be reached, and the degree of stability or otherwise of the blood-urea. The last-named consideration was of particular import, because it would govern the choice of the period most suitable for calculation of urea clearance after urea.

The nitrogen-fasting level of the blood-urea was 17–40 mg. per 100 c.cm. and was therefore representative of the accepted normal range. This initial figure had no effect on the type of the subsequent curve. The most striking feature of the blood-urea curves was their variability both in the height reached and in the time taken before the peak was attained. In forty-nine of our fifty subjects the increase in blood-urea from the resting level was 21–54 mg. per 100 c.cm.; one isolated value of 68 mg. was found, and the average increase in the whole series was 35 mg. per 100 c.cm. It was hoped that some degree of regularity in the blood-urea—time curves would show itself if the measurements of blood-urea were taken frequently enough. Our results, however, demonstrate clearly that this is not the case (table II). The curves fell roughly into the following types, the number of subjects in each group being given in brackets: steeply rising and steeply falling (4), steeply rising and steady (13), steeply rising and slowly falling (7), steeply rising and oscillating (9), slowly rising and steady (12), slowly rising and slowly falling (3), and slowly rising throughout (2). Representative samples are plotted in figs. 1–7. In fig. 8 a

composite curve is given, based on the mean values for the fifty persons, which were as follows: resting blood-urea 28 mg. per 100 c.cm.; ¼ hr. after urea, 49 mg. per 100 c.cm.; ½ hr., 59 mg.; 1¼ hr., 59 mg.; 1½ hr., 58 mg.; and 2¼ hr., 55 mg. per 100 c.cm.

It is obviously desirable, if a routine urea-clearance technique is to be based on an investigation of this kind, to discover whether most of the subjects exhibit a period during which the blood-urea level remains relatively stable, because this would permit a reduction in the number of specimens required for the test. We have consequently examined our figures closely with this purpose in mind, and the summarised results are given in table III, in which variations of less than 5

TABLE II—TIME TAKEN BY BLOOD-UREA TO REACH MAXIMUM AFTER INGESTION OF UREA BY MOUTH

Time (hours)	Subjects	Time (hours)	Subjects
¼	4	1¼	6
½	21	1½	1
1¼	18		

mg. per 100 c.cm. in the consecutive blood-ureas are designated "steady" for the intermediate period between the two observations.

It appears that for no appreciable time during the test does the blood-urea remain stable in all the subjects, but the table suggests that this is most likely to be the case around the 1¼ hr. mark. At this point the great majority of curves are steady, and the number of those showing a moderate rise is almost equalled by the number of those showing a similarly moderate fall. The magnitude of the difference between blood-urea values at the ¾ hr. and 1¼ hr. stages of our test have been examined, and in thirty-nine out of our fifty subjects this difference does not exceed 10 mg. per 100 c.cm. Further, in every case the mean blood-urea value calculated from the ¾ hr. and 1¼ hr. analyses very closely approximates the 1¼ hr. blood-urea.

TABLE III—STABILITY OF BLOOD-UREA LEVEL

Period (hours)	Subjects showing steady blood-urea	Showing rise	Showing fall
¾–1¼	29	11	10
1¼–1¾	30	4	16
1¾–2¼	29	3	18

Calculation of the urea clearance.—Figures were obtained for five consecutive half-hourly periods after the administration of urea by mouth and were compared with those of urea clearance before the administration of urea. In a general way it can be said that where the initial value was low there was in every instance an increase in the clearance after the ingestion of urea. Where, however, the initial clearance is already well within the van Slyke range of normal values the subsequent deviation is not so obvious, but in most cases there is some increase. The falls in clearance after the ingestion of urea are confined almost exclusively to the cases where the original clearance is approaching the upper normal limit of the Van Slyke range—e.g., a person with an initial clearance of 115 per cent. of normal gave a mean value of 102 per cent after the ingestion of urea. Of our fifty subjects ten remained steady, thirty showed a rise, and ten a fall when the mean value after

TABLE IV—DISTRIBUTION OF UREA-CLEARANCE VALUES AFTER INGESTION OF UREA

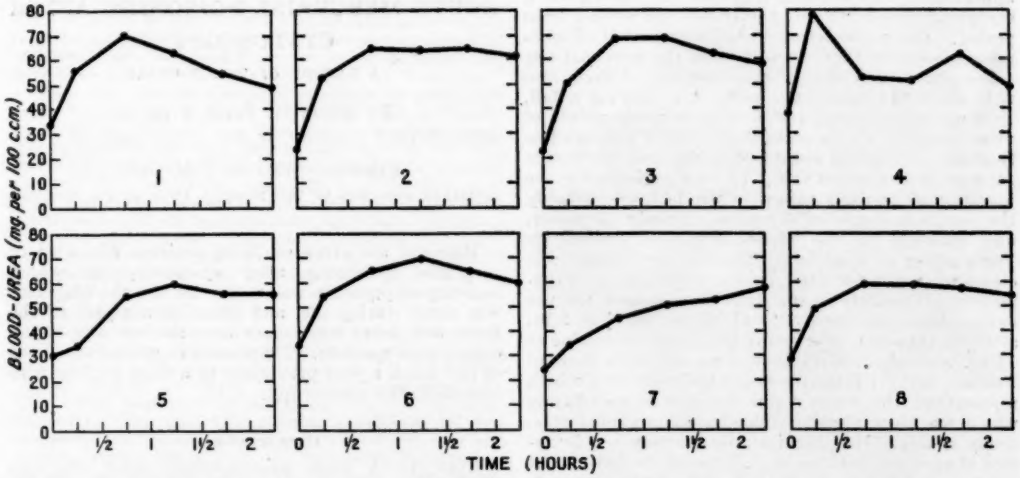
Percentage urea clearance	Subjects	Percentage of urea clearance	Subjects
Less than 70	Nil	101–110	13
71–80	10	111–120	3
81–90	10	131	1
91–100	13		

ingestion of urea was compared with that before ingestion of urea (the criterion of steadiness was a difference of not more than 10 per cent. between the two values). In computing the mean value after the ingestion of urea we have taken into account only those periods where the blood-urea might be regarded as relatively stable as judged from the successive blood analyses; on these grounds the clearance value for the first half-hour period is always excluded. Comparison of table I with table IV will demonstrate the general tendency to increase of clearance values after the ingestion of urea.

Concentration of urea in the urine.—Data of this concentration during the period of our test have only been regarded as incidental in this series of investiga-

TABLE V—UREA CLEARANCE AFTER INGESTION OF UREA IN RENAL DISEASE

Case	Percentage of urea clearance before and after ingestion of urea		Remarks
	Before	After	
1	76	74	Albuminuria, history of severe pyelitis, slight œdema of legs
2	40	88	Focal hæmorrhagic nephritis, albuminuria; urine: many red cells but no casts
3	61	72	Doubtful history of nephritis; urine: trace of albumin, many leucocytes and red cells, no casts
4	63	56	Acute nephritis; urine: albumin, few granular casts, many leucocytes and red cells; made good recovery later
5	82	63	Headaches, raised blood-pressure; urine: persistent albuminuria, many red cells and leucocytes, few hyaline and granular casts
6	65	64	Persistent albuminuria, raised blood-pressure; urine: many hyaline casts, few leucocytes
7	54	56	Urine: heavy albuminuria, few granular and epithelial casts, numerous pus cells and few red cells
8	45	65	Persistent albuminuria; urine: many red cells and leucocytes, few renal cells and epithelial casts
9	75	58	Tonsillitis followed by nephritis; urine: albuminuria, numerous red cells, no casts
10	58	41	Acute nephritis; urine: heavy albuminuria, numerous red cells and hyaline casts
11	20	69	Occasional œdema, low plasma albumin; urine: heavy albuminuria, many red cells and leucocytes; renal cells, no casts
12	22	22	Hypertension, headaches, heavy albuminuria, hæmaturia
13	40	23	Severe attack of nephritis after tonsillitis; heavy albuminuria, hæmaturia
14	13	14	Severe hypertension, bordering on uræmia
15	19	16	Bordering on uræmia



FIGS. 1–7—Representative blood-urea curves of different types: fig. 1, steeply rising and steeply falling; fig. 2, steeply rising and steady; fig. 3, steeply rising and slowly falling; fig. 4, steeply rising and oscillating; fig. 5 slowly rising and steady; fig. 6, slowly rising and slowly falling; fig. 7, slowly rising throughout.
FIG. 8—Composite blood-urea curve based on mean values of fifty persons (see text).

tions. We used the original urease method with aeration and titration (Van Slyke and Cullen 1914, 1916). Nearly all our subjects attained values generally accepted as normal after a 15 g. dose of urea. In the five instances where the concentration of urea fell below this normal level the urea-clearance values after urea showed satisfactory renal function. For example, one subject gave a maximal concentration of urea of 1·35 per cent. in 47 c.cm. of urine for one of our half-hourly periods of collection, yet his clearance before the administration of urea by mouth was 90 per cent. and afterwards 96 per cent. of normal.

THE TEST IN RENAL DISEASE

We had an opportunity of studying the behaviour of a small group of nephritics after the ingestion of 15 g. of urea. The same detailed half-hourly analysis was made as in the foregoing group. The subjects were chosen in such a way as to give examples varying from those in whom evidence of renal involvement was very slight to those bordering on uræmia. The general tendency in this small series was for the maximal elevation of blood-urea after the ingestion of urea to be somewhat greater than in the normal series, the range of increase being 25–63 mg. per 100 c.cm. above the original level. The clearance values have been again compared in table v; and, if generalisation is permissible from so small a number, it can be said that in definite renal disease there was either a fall or no change in urea clearance after the ingestion of urea, whereas in mild or doubtful nephritis a rise was recorded.

DISCUSSION

The object of this work has been to observe the effect of a large dose of urea on the clearing capacity of the kidneys. Our results have confirmed previous observations that the Van Slyke technique often yields in normal subjects clearance values well below the accepted standards. Thus reference to table I shows that nineteen of our fifty normal subjects would fail to qualify as normal even on the basis of the minimal requirement of 70 per cent. level. In all these instances normal values for urea clearance were obtained after the administration of a 15 g. dose of urea by mouth. In parallel experiments on patients with evidence of renal disease the ingestion of urea did not as a rule improve the clearance figures, and in fact a fall was often recorded in such cases. We saw no harm resulting from giving this heavy dose of urea to patients with an already high level of blood-urea, though this procedure would not commend itself as a routine in obvious cases of uræmia or in the acute phase of nephritis.

Frequent collections of specimens of urine and of blood after the ingestion of urea enabled us to follow more closely its effect on the functional capacity of the kidneys. It is obvious that any reliable calculation of the urea clearance over any particular period of time must be based on the knowledge that the blood-urea remains reasonably constant throughout. The degree of constancy or otherwise of this factor after the administration of urea by mouth will depend largely on the rate of absorption of urea from the bowel and of its disposal from the blood-stream by the kidney. A study of our blood-urea curves, based on half-hourly observations, while showing considerable individual variability, demonstrates that a relatively stable period exists in most subjects between ¾ and 1¾ hours after the administration of urea by mouth. The blood-urea observed at 1¼ hour approximates very closely in every instance to the mean calculated from the ¾ hour and 1¾ hour values. Fowweather, who first proposed the application of the Van Slyke clearance formulæ to specimens obtained after the administration of urea by mouth, utilised the second hour after for his procedure. To satisfy himself concerning the stability of the blood-urea during this period he examined the blood at the beginning and end of the second hour in a series of thirty-three normal subjects. The results are very briefly recorded, and it should be observed that the differences between the values of these two times are expressed in terms of blood-urea "nitrogen," which has the effect of minimising by a half the actual blood-urea differences. In the final form suggested for routine

application Fowweather proposes the taking of a sample of blood towards the end of the second hour period. Our more detailed observation of the blood-urea has shown that in most cases the maximal rise takes place quickly after the ingestion of urea, and that at the 1¾ hour stage many are showing a fall. In a practical clinical test it is from many points of view desirable that a collection of urine over no less than an hour period should be made, and our results support the choice of the ¾–1¾ hour period after the ingestion of urea to attain what will be most probably the maximal degree of accuracy. Despite, however, our criticism of the blood-urea data offered by Fowweather we must record that in other respects the clearance levels obtained by his technique are satisfactory. From the urine data we obtained for the two separate periods of 1 to 1½ hr. and of 1½ to 2 hr. after the ingestion of urea and the blood-urea value at 1¾ hr. we computed results comparable with those of Fowweather. His figures agreed well with ours, which represented the mean value for the period during which we knew that the blood-urea remained relatively steady. In a few instances there was a deviation of as much as 10 per cent. between the two sets of results, which is not of serious importance when results are well within the normal range. It is obvious, however, that an error of this magnitude in the border-line region of normality might be undesirable. Therefore we recommend the following slight modification of Fowweather's procedure :

The patient is allowed to have his usual meal the night before the test. On the morning of the test a light breakfast of bread, butter, and a piece of fruit, with one small cup of tea, is permitted. Approximately two hours after this the test begins. The patient empties the bladder completely, and immediately afterwards 15 g. of urea in 200 c.cm. of water is given, the time being carefully noted. The bladder is again emptied after 45 min. and the exact time recorded. This is repeated an hour later. Midway between these two collections of urine—i.e., at 1¼ hour after the administration of the urea—a specimen of blood for the determination of the urea content is obtained. For example, the following time-table might be used :

Breakfast	8 A.M.
First specimen of urine and administration of urea by mouth	10 A.M.
Second specimen of urine	10.45 A.M.
Specimen of blood	11.15 A.M.
Third (last) specimen of urine	11.45 A.M.

The urea clearance is calculated from the data obtained from analysis of the third specimen of urine.

SUMMARY

(1) The renal function of fifty normal subjects before and after taking urea by mouth was studied.

(2) The abnormally low urea-clearance values often obtained by the original Van Slyke technique were found to disappear after the ingestion of urea.

(3) In a small series of patients with evidence of renal disease, those with definite disease seemed to show a fall or no change in clearance after urea, whereas mild cases showed a rise.

(4) The blood-urea was found to be relatively stable between ¾ and 1¾ hour after taking urea.

(5) On this basis a practical test is suggested.

We wish to thank members of the nursing and medical staffs who gave their free time for the purpose of this investigation.

References at foot of next column

ACUTE MERCURIAL POISONING AFTER CYSTOSCOPY

A REPORT OF THREE CASES

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Reports are given on three patients who died of mercurial poisoning after cystoscopy in which mercury oxycyanide was used. In two the diagnosis was made during life, and chemical analyses of the urine and fæces were made ante mortem and of the organs post mortem. These cases suggested the cause of the death a year previously of a third patient who had died after cystoscopy.

CASE-RECORDS

Case 1.—A male paint-sprayer, aged 18, was admitted to hospital, under Dr. R. A. Rowlands, with several weeks' history of repeated attacks of severe right-sided abdominal pain, which had been relieved with morphia by his private doctor.

The patient, a deaf mute, was coöperative and intelligent. He was well nourished and had no pain when examined. Pulse regular, apex-beat not displaced, and blood-pressure 140/60. No abnormal signs detected in lungs ; no abdominal rigidity or tenderness ; liver, spleen, and kidneys not felt. Apart from deaf-mutism, nothing abnormal in central nervous system.

Urine alkaline, specific gravity 1·015, no albumin, no sugar ; many red blood-cells, occasional leucocytes, amorphous phosphates, and oxalates on microscopy of deposit. Culture proved sterile. Volume 26–56 oz. daily. Blood-count normal : hæmoglobin 113 per cent., leucocytes 8000. Radiography of renal tract showed a shadow near the right ischial spine, which was shown by intravenous pyelography to be in the line of the right ureter. Right renal calyces slightly dilated. Calculus in the right ureter was diagnosed.

On May 20, 1938, cystoscopy and catheterisation of the right ureter were performed under general anæsthesia (A.C.E. and ether). The bladder was washed out with a 1 in 4000 solution of mercury oxycyanide and filled with 8 oz. of the same solution. Cystoscopy showed very slight cystitis and normal ureteric orifices. A catheter was passed easily up the right ureter for 20 cm. after a momentary check at 4 cm. ; 4 c.cm. of sterile liquid paraffin was injected into the lowest 5 cm. of the ureter. When the cystoscope was about to be withdrawn, it was seen that there had been slight hæmorrhage from the neck of the bladder. The solution was left in the bladder.

After the operation there was fairly severe vomiting, thought to be postanæsthetic. During the first twelve hours 20 oz. of bloodstained urine was passed ; during the second twelve hours no urine ; during the third 6 oz., bloodstained. On the second day the patient began to have bloody diarrhœa and vomited everything he was given. On the third day fourteen motions, consisting of blood and mucus, were passed, vomiting was severe, and there was distressing hiccup ; the patient complained of thirst, and at this

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time the gums became purplish and swollen, with bleeding and discoloration of the alveolar margins. The condition became steadily worse, and intravenous injections of saline were given by the continuous drip method, 1000, 600, and 600 c.cm. being given on the fourth to sixth days.

There was almost complete retention of urine, the daily volumes being 1½, 3, 4, 2½, and 1 oz. of bloody urine to the end of the first week after operation. The stomatitis and gingivitis became more severe and the breath foul, and there was persistent vomiting and hiccup. The abdomen was slightly distended, and there was tenderness in the right iliac fossa; diarrhœa continued up to six motions daily, the stools consisting of blood and mucus. The blood-pressure rose from 150/76 on the fourth day to 170/100 on the tenth day; the blood-urea was 160 mg. per 100 c.cm., rising on the third day to 280 mg. per 100 c.cm. at the end of the first week.

Intravenous drip saline infusion was continued, 1000–2000 c.cm. daily, and during the second week the urinary output steadily increased, 15, 23, 35, 29, 73, 72, and 52 oz. being passed on successive days. The urine was still bloodstained but less so than formerly. The patient's general condition did not improve; he became increasingly drowsy by day and restless during the night; the stomatitis became less severe, but vomiting was still frequent. The pulse-rate, which had been about 90, increased to 120–130. The motions contained less blood than before but were more numerous, up to fourteen daily. A blood-count showed a diminution in hæmoglobin to 86 per cent. and a leucocytosis of 20,000.

Two weeks after the operation the blood-urea had risen to 650 mg. per 100 c.cm., and the plasma chloride was 540 mg. NaCl per 100 c.cm.; there was persistent hypertension about 170/100 mm. Hg. The patient gradually became more drowsy, with twitching of the muscles, and died seventeen days after the operation; the final blood-urea was 690 mg. per 100 c.cm. and the hæmoglobin 35 per cent.

Necropsy.—The body was that of a well-developed but slightly wasted man. Bladder and ureters: bladder slightly dilated; deep ulceration (6 × 5 sq. cm.), with base formed by muscularis, in lower part of posterior wall of bladder and in upper half of prostatic urethra. Superficial inflammation (7 × 4 sq. cm.) immediately above this, with necrosis, purulent inflammation, and thrombosis involving all the wall except outermost muscularis and serosa. Mucosal hæmorrhage in prostatic and penile urethra. Ureteric orifices patent in area of deep ulceration. Calculus (0·9 cm. largest diameter) impacted in lower end of right ureter, which was slightly dilated and injected, especially at its lower end. Very slight dilatation of the right renal pelvis; injection of both renal pelves.

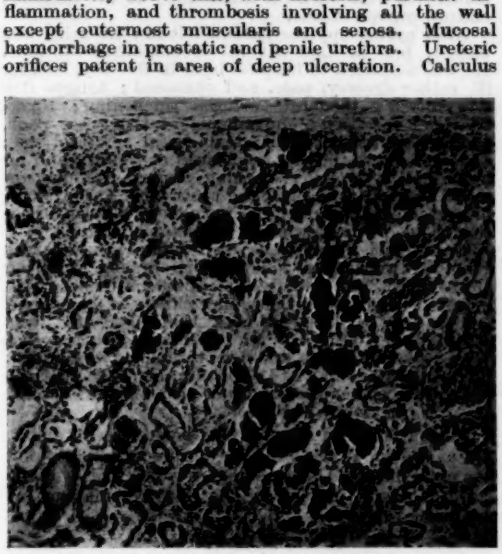

FIG. 1—Case 1: necrosis and calcification of tubular epithelium of kidney. Hæmatoxylin and eosin. (× 78.)

FIG. 2—Case 2: areas of necrosis and ulceration in cæcum.

Kidneys: much œdema and cloudy swelling, with extensive desquamation, calcification, fibrinoid necrosis, and regeneration of epithelium; focal, acute, chiefly leucocytic interstitial infiltration (fig. 1).

Intestine: acute focal ulceration of large intestine. Acute, usually fibrinoid, necrosis of media and thrombotic occlusion of lumen of arterioles within and beneath focal areas of necrosis and ulceration of mucosa and inner submucosa in cæcum, ascending colon, and less frequently in rest of colon and rectum. Purulent infiltration of necrosed tissue; great œdema, areas of hæmorrhage, very great infiltration with large epithelioid cells, and occasional cellular endophlebitis in subjacent mucosa. Slight enlargement of mesocolic glands.

Pancreas: "hæmorrhagic pancreatitis." Lipolysis and hæmorrhage in interstitial septa of pancreas with proteolytic digestion of a zone of adjacent parenchyma. Acute coagulative and fibrinoid necrosis of media of arteries within, at margins of, and occasionally outside the digested tissue.

Gums: gum margins of upper and lower central incisors undermined for distances up to 0·3 cm.; pus in undermined margins of lower incisors. Very slight infiltration of mucosa of gums with neutrophil leucocytes and slight perivascular infiltration of submucosa with plasma cells, lymphocytes and occasional neutrophil leucocytes. Blue discoloration of gums opposite spaces between teeth. Ulceration of mucosa on right and left margin of tongue, with masses of gram-positive and negative cocci and a few bacilli in its base, and zone of purulent infiltration and necrosis beneath base.

Lungs: inflammatory œdema and purulent, probably aspiration, bronchopneumonia containing masses of gram-positive streptococci in lower lobe of left lung; œdema of remainder of lungs. Slight fibrinous pleurisy over left lower lobe; slightly turbid right pleural effusion (10 oz.), clear hæmorrhagic left (3 oz.).

CASE 2.—A male tailor, aged 58, had been in hospital five years ago (1933) with lower abdominal pain and difficulty in passing urine. At that time radiography revealed a vesical calculus, which was removed by suprapubic lithotomy. Three years ago (1935) he had painful micturition, but radiography of the urinary tract showed nothing abnormal; cystoscopy at that time showed fine trabeculation of the bladder, with a sacculus in the fundus and much residual urine.

In August, 1938, the patient again attended the outpatient department with three weeks' history of abdominal pain and difficulty in passing urine. Cystoscopy was performed under local anæsthesia with a 0·1 per cent. solution of Percaine on August 28, 1938. About 40 oz. of urine was drawn off from the bladder and 8–10 oz. of a 1 in 4000 solution of mercury oxycyanide run in. The bladder was normal except for fine trabeculation; there was no cystitis and no enlargement of the prostate. The solution was left in the bladder after cystoscopy, and the patient went home.

Twenty-four hours later he was admitted to hospital with abdominal pain and inability to pass urine. He had passed about 4 oz. of dark-coloured urine three hours after cystoscopy, after which there was complete inability to urinate. He was in considerable distress, with sunken cheeks and a dry furred tongue; temperature 98° F., pulse-rate 72, respiration-rate 20; no abnormal signs were detected in the heart and lungs; there was lower abdominal distension and some tenderness in the hypogastrium; the prostate did not appear to be enlarged; nothing abnormal was found in the nervous system. On catheterisation, 18 oz. of bloodstained urine was withdrawn.

The patient vomited frequently after admission, and the blood-urea on the 29th was 140 mg. per 100 c.cm. On the second day bloody diarrhœa set in, motions being passed at 10 min. intervals. Intravenous drip saline infusion was started on admission, 500, 1500, 1050, 2100, and 600 c.cm. being given in the first five days. The colon was washed out on the day after admission. The symptoms did not improve; there was frequent vomiting, neither food nor fluid being retained; diarrhœa persisted, with frequent small bloodstained stools; and there was almost complete suppression of urine, the daily volumes after the initial catheterisation being nil, nil, 1, ½, and 2½ oz.

At the end of the first week the blood-urea had risen to 340 mg. per 100 c.cm. The general condition had slightly improved, dehydration being less, and the patient being able to retain fluids given by mouth. The bladder became slightly distended, and 12 oz. of bloodstained urine was obtained by catheter. The blood-pressure rose from 150/75 on the third day to 174/100 on the sixth day. During the second week continuous drip saline was resumed, and there was a progressive increase in urinary output, 14, 24, 38, 51, and 24 oz. being passed on successive days. Vomiting however, continued, though less severe, and the blood-urea rose to 430 mg. per 100 c.cm. on the tenth day; there was no improvement in the diarrhœa, the stools being frequent and containing much blood.

In spite of continued intravenous and rectal saline infusions the patient became gradually weaker, the blood-pressure fell to 98/62, and death took place on the thirteenth day. The blood-urea rose to a final value of 600 mg. per 100 c.cm.

The *necropsy* was performed outside the hospital, and the following tissues were obtained for examination: kidneys, bladder and penis, terminal ileum, cæcum, appendix, and large intestine.

Bladder and ureters: bladder hypertrophied (muscular coat 1·5 cm. thick). Mucosa and inner submucosa beset with areas of ulceration and superficial necrosis, followed by zone of purulent infiltration. Œdema, hæmorrhage, and infiltration with epithelioid cells in outer submucosa; patchy loss of muscle-fibres and apparent increase in interstitial tissue in muscularis throughout the wall; numerous gram-positive cocci on necrosed inner surface; necrosed thrombosed vessels in inner necrosed purulent zones. Slight projection of middle lobe of prostate; one small adenoma and areas of great desquamative catarrh in microscopic section of right lobe of prostate.

Kidneys: no dilatation of renal pelves; numerous petechiæ in renal pelvis of right kidney, a few in left. Cloudy swelling and slight fatty degeneration of kidneys, with desquamation, fibrinoid necrosis, occasional calcification, and conspicuous regeneration of epithelium; great œdema and focal chronic, chiefly lymphocytic, infiltration of interstitial tissue. Infiltration of left renal pelvis with lymphocytes and a few plasma cells; hæmorrhage and area of necrosis in adjacent angle of calyx.

Intestines: injection of, and a few hæmorrhages in, lower ileum. Focal areas of ulceration and necrosis in cæcum and ascending colon (fig. 2), followed by a zone of purulent inflammation in mucosa and inner submucosa; necrosis and thrombosis of vessels in necrotic and purulent zones. Great œdema and infiltration with epithelioid cells in outer submucosa; loss of muscle-fibres in inner muscularis; masses of gram-positive cocci and occasional areas of calcareous impregnation in necrosed inner zone. Larger number of such necrotic areas in proximal half of transverse colon, becoming confluent in distal half and in descending and pelvic colon; a few in rectum.

CASE 3.—A male tailor, aged 69, attended the outpatient department with three months' history of attacks of abdominal pain lasting one or two days, with frequency of micturition 1–2 hourly by day. His tongue was dry and furred and his teeth carious; blood-pressure 200/95; chest movements poor, with scattered rhonchi; abdomen obese, but nothing abnormal detected; nothing abnormal discovered per rectum.

A week later the patient passed bright red blood in his urine, this lasting one day. Cystoscopy was performed on May 23, 1938, under local anæsthesia with a 0·1 per cent. solution of percaine, and the bladder was filled with a 1 in 4000 solution of mercury oxycyanide. There were multiple small submucous hæmorrhages and œdema of the vesical mucosa, but no intravesical enlargement of the prostate. Although there is no definite record, the oxycyanide solution was presumably left in the bladder, this being the usual procedure after cystoscopy in the outpatient department. The urine obtained at cystoscopy was acid and contained no sugar or albumin: occasional leucocytes were seen on microscopy of the deposit; culture proved sterile.

After cystoscopy the patient felt ill; no urine was passed, but he had several bloodstained motions. He was admitted to hospital later in the day, looking ill, rather drowsy, pale, and cyanosed; tongue dry and furred; moderate arterial thickening; apex-beat not localised; movements of the chest poor, with scattered rhonchi and basal crepitations; abdomen obese, but no tenderness or rigidity and no abnormal mass felt; nothing abnormal found on rectal examination, or in the central nervous system, or on radiography of the urinary tract. Catheterisation yielded a few drops of bloodstained urine.

Continuous intravenous drip saline infusion was given for twenty-four hours. There was no vomiting at the onset, but there was fæcal incontinence, with repeated small stools consisting chiefly of blood and mucus. On the fourth day the blood-urea was 230 mg. per 100 c.cm. On the fifth day there was a large projectile vomit, and 6–8 oz. of urine was passed. The blood-pressure was 150/65 mm. Hg. The patient gradually became weaker and died on the seventh day. No necropsy was made.

This patient died about a year before cases 1 and 2, and at the time the possibility of mercurial poisoning was not considered. Probably, however, this was the cause of death, in view of the close resemblance to the other cases.

CHEMICAL ANALYSES

In cases 1 and 2, where the diagnosis was made during life, the urine and fæces were examined, and

mercury was found. In these cases mercury was found in kidney, liver, and intestines post mortem, the method of analysis being controlled against post-mortem material from another case where there had been no exposure to mercury. The mercury oxycyanide used in the cystoscopies was assayed and found to be HgO 20·3 per cent. and $Hg(CN)_2$ 79·6 per cent. The concentration of the solution was 1 in 4000, and 8 oz. (the usual quantity introduced into the bladder) would contain 28·6 mg. of mercury.

COMMENTS

The use of mercury solutions in cystoscopy must be very widespread and in this hospital extends back thirty years. Mercurial poisoning as a complication appears to be extremely rare, but it is possible that occasional instances in the past have escaped recognition. Recent reports suggest, in fact, that similar cases have been observed in other genito-urinary clinics (d'Abreu and Lysaght 1935, 1936). The occurrence of acute mercurial poisoning after cystoscopy might be due to one or more of three factors: the mistaken use of a highly concentrated solution; abnormal circumstances leading to excessive absorption of the mercurial salt; or idiosyncrasy of the patient. Chemical analysis of the organs was not sufficiently complete to give a conclusive answer, but, so far as it went, did not suggest that the solution of mercury was too concentrated. Moreover, other patients were cystoscoped on the same days as cases 2 and 3, the same solutions being used and no ill effects being observed. In all three cases the mercury solution was left in the bladder after cystoscopy and was not voided by the patient for some considerable time. Moreover, in cases 1 and 2 morbid changes in the bladder were unusually severe. To what extent absorption might be favoured by such factors as retention after cystoscopy, instrumental trauma, cystitis, distension of the bladder, and possible reflux of fluid into the ureters and renal pelves it is impossible to decide. In view of the rarity of this condition we suggest that idiosyncrasy to the drug, possibly combined with abnormal retention and absorption of the solution, may have caused these fatalities. Whether or not this is the correct explanation, the fact of the mercurial poisoning remains, and there is no doubt that the use of mercury oxycyanide solution in cystoscopy is dangerous.

We wish to express our thanks to Dr. R. A. Rowlands, Mr. George Neligan, and Mr. Victor Dix for permission to publish these cases; to Prof. Hubert M. Turnbull for his description of the pathological findings; and to Mr. R. G. Bowler for the chemical analyses.

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Princess Mary's R.A.F. Hospital at Halton, Bucks, was opened in 1927; since then its buildings have been gradually extended and enlarged, and it now provides accommodation for 715 patients. It is organised into medical, surgical, families, and infectious disease divisions. The infectious disease division, with 278 beds, is a quarter of a mile from the main hospital, and although administered from there, has its own separate medical staff. It occupies a new block as well as numerous separate pavilions. Separate accommodation is allotted to cases of pulmonary tuberculosis, skin disease and venereal disease. This division also has its own operating-theatre. At the massage and electrotherapeutic department some 80–100 treatments are given daily, and the equipment has lately been reinforced with a portable electrotherapeutic set, a self-contained short-wave, direct current, "Rotosurge," ultraviolet, infra-red, radiant heat, hot-air douche and paraffin-wax outfit, that can be brought to the patient's bedside. The radiological department averages 600 examinations a month.

EXTRACRANIAL LIGATURE OF THE MIDDLE MENINGEAL ARTERY

By Maximilian Wassermann, M.D. Prague
FORMERLY PUBLIC-HEALTH COUNCILLOR OF BOHEMIA

In the last war many wounded died of hæmorrhage from the middle meningeal artery before reaching hospital, where the normal procedure, trephining and intracranial ligature, could be done. Ligature of the external carotid often proved disastrous. The middle meningeal artery used to be ligatured extracranially by first resecting the condyle of the mandible. This made it necessary to keep the patient, whose condition—generally intracranial hæmorrhage—was of itself serious, some weeks with his mouth closed and on liquid diet. Trephining has now lost its horror. In emergencies it is the best way in spite of the risk of having sometimes to trephine in a second place, when the bleeding branch has been missed; but, even when it is practicable and the hospital reached in time, in some cases only an extracranial ligature is advisable, even of the external carotid.

ACCESSIBILITY

Many years ago the present writer[1] discussed the accessibility of this region and suggested the ligature of the middle meningeal artery in its extracranial part without any resection of the condyle. So far as I know, the method suggested in the article was never followed. My proposed ligature of the middle meningeal artery depends on the fact that, when the mouth is opened, the condyle of the mandible, pulling with it the articular disk, glides along the articular tubercle of the temporal bone downwards and forwards. Through this movement the space between the mandible and the cartilaginous part of the external auditory meatus is enlarged by 1 cm. or more. I have never seen the surgical application of this fact mentioned. Opening the mouth to its widest extent, however, does not lead to the greatest accessibility of this region, because, as the condyle is pulled forwards as far as possible, the angle of the mandible is simultaneously drawn backwards; hence this region becomes narrower in its inferior part. Moreover, with the mouth opened to its widest extent, any lateral movement of the mandible, so suitable for better accessibility, is nearly impossible. Therefore the best accessibility is gained by opening the mouth half-way and by simultaneously pulling the mandible towards the opposite side.

OPERATION

The posterior limit of the incisions is determined by the position of the auriculotemporal nerve and of the superficial temporal artery; hence it is best to make an angular incision through the skin, with the mouth closed, the vertical part being made over the temporomandibular joint and the horizontal part just below the zygomatic arch and extending about an inch forwards. Care must be taken to avoid any injury of the trunk of the facial nerve, as it crosses the lower part of the field of operation, passing from the stylomastoid foramen, behind the stylomastoid process, and through the parotid gland in a curve, which is partly straightened by movement of the lower jaw. In the horizontal part of the incision we next dissect the insertion of the tendinous fascia into the zygomatic arch. This cannot be done without destroying

1. Wassermann, M. (1900) *Wien. klin. Rdsch.* No. 14.

some minor branches of the facial nerve and some vessels, all of minor importance. From above we dissect downwards behind the parotid gland, which is strongly adherent to the fascia, its proper cover. By blunt dissection along the temporomandibular ligament the bulk of the gland is pulled downwards as far as the level of the neck of the condyle. Next, the assistant puts his well-bandaged hand in the patient's mouth, which he opens till the incisors are not more than an inch apart, at the same time drawing the mandible as far as possible to the opposite side and holding it there. When this has been done, the vertical incision now lies over the region behind the condyle and we have to clear this space, always pulling the flap with the parotid downwards and using blunt dissection through the loose connective tissue and through the projecting part of the parotid gland as far as the level of the neck of the condyle. There, immediately behind the bone, begins the horizontal part of the internal maxillary artery. By isolating this vessel, we find proximally the origin of the deep auricular artery and, further on, that of the tympanic artery, both of them running through the loose tissue, some dispersed lobules of the parotid gland, and, between occasional strands of dense fibres, parts of the deep layer of the fascia which envelops the gland externally and internally. The backward direction of both of these arteries makes it impossible to mistake one of them for the middle meningeal artery, because this vessel, besides running upwards and inwards, runs forwards. When the mouth is closed or, as in speaking, only slightly opened, the origin of the middle meningeal artery lies close to the medial surface of the neck of the condyle, sometimes nearer the posterior, sometimes nearer the anterior, margin of this surface. Then the artery ascends, with the mandibular insertion and, further on, the internal margin of the external pterygoid muscle on the lateral side, and the sphenomandibular ligament on the medial side. It passes between the two roots of the auriculotemporal nerve—when there are two roots—before it enters the cranial cavity through the foramen spinosum. This foramen is placed about an inch medial to the zygomatic arch.

All the other important foramina of the cranial base in this region—ovale, rotundum and lacerum—are placed more medially, with the important vessels and nerves that enter the cranial cavity through them, such as the mandibular part of the trigeminal nerve, the internal jugular vein, the hypoglossal nerve, the accessory nerve, and the internal carotid artery; hence injury of these structures can easily be avoided. On the other hand, it is sometimes impossible to avoid injuring the auriculotemporal nerve, which for part of its course accompanies the middle meningeal artery, till—after sending some small branches to the ear—it runs upwards round the zygomatic arch with the superficial temporal artery.

The lower part of the middle meningeal artery participates in every movement of the mandible but does not move to the same extent. When, with the mouth half-open, the jaw is drawn towards the opposite side and the neck of the condyle advances half an inch, the origin of the middle meningeal artery is drawn forwards a quarter of an inch. So we can make—at least in most cases—the middle meningeal artery visible and ready for ligature by pulling on the isolated internal maxillary artery. If in an abnormal case this is impossible, we can then always ligature the internal maxillary artery and so stop the hæmorrhage. The subdural hæmatoma could be removed by a second operation at a later date if necessary.

TREATMENT OF GAS GANGRENE

By Emidio da C. Afonso, M.D.

It is commonly taught that all tissues affected by gas gangrene should be immediately excised. Excision, however, with or without cauterisation, can be done only when the gangrene is not far advanced; in most cases the affected area is already so large that excision is clearly contra-indicated by shock and toxæmia. For this reason I have substituted for excision extensive cauterisation, which checks the spread of the gangrene and eliminates the gangrenous tissues. Cauterisation further stimulates the neighbouring healthy tissues besides transforming the necrotic tissues into a mass of products of combustion in which the development of anaerobic micro-organisms is impossible.

In gas gangrene affecting an area large enough to contra-indicate excision the following treatment has been successfully employed:—

(1) Careful delimitation of the necrotic zone. The necrosis begins with the destruction of the albuminoid molecule; the bubbles of gas are liberated later. Loss of sensibility is an earlier symptom of gas gangrene than is crepitation, which extends far less widely than the necrosis.

(2) Thorough washing of cavities, removal of foreign bodies and blood-clots, and excision of muscle debris.

(3) Cauterisation of the neighbouring healthy tissues with a sharp-pointed cautery, encircling the gangrenous area with a line of superficial ignipunctures 1 cm. apart, 3 cm. outside the necrotic area.

(4) Incision of the necrotic tissues in several places, followed by insertion of the cautery into each incision, the cautery being moved to and fro in every possible direction, especially into the deeper tissues. If the patient is not anæsthetised, the cautery should be pushed in until it causes pain. No necrotic tissue should escape the cautery. If complete cauterisation is not possible at the first attempt, it should be finished next day. Some discrimination in the amount of cauterisation is necessary in the presence of nephritis; but apparently there is not much danger from absorption of the products of combustion due to the cautery.

(5) Intravenous injection of anti-gas-gangrene serum, one or two injections being given of 80–100 c.cm. of serum in 1000 c.cm. of normal saline. These injections have to be given after desensitisation and so slowly that they take 1–1½ hours to finish. Detoxication by the serum takes place rapidly.

Two days after cauterisation most of the necrotic tissue will be found dry and shrivelled, like smoked meat. It can be easily removed with scissors. The underlying tissues, purulent at first, will gradually develop a rosy appearance with healthy granulations. With this treatment we have been able to transform a gangrenous into a granulating wound, ready for autoplastic grafts if desired. This simple treatment is solely based upon the efficacy of cauterisation as opposed to excision, and I publish it in the hope of minimising the otherwise terrible prognosis of gas gangrene.

Nova Goa, Portuguese India.

MEDICAL SOCIETIES

BRITISH INSTITUTE OF RADIOLOGY

AT a joint meeting of this institute with the Faculty of Radiologists and the section of radiology of the Royal Society of Medicine held on March 16 with Mr. G. F. STEBBING in the chair, a discussion on the practice of

Radiotherapy in War-time

was opened by Mr. B. W. WINDEYER. He said that a month or six weeks after the outbreak of war the Ministry of Health began to take an interest again in radiotherapy, and the officers of that department at the Middlesex Hospital were able to reopen it. The work was now slightly below the normal peace-time level. One of the greatest difficulties was that the hospital had been taken over as an emergency hospital and it was therefore difficult to get beds opened. The department now had 32 beds, half what it had before the war. A greater proportion of patients had to be treated as outpatients. The medical staff had lost two assistants, and they had therefore less chance of doing reading or clinical research. It would soon be difficult to find laboratory assistants and technicians, who are now being called up for military service. An entirely different type of patients was coming to the department. Carcinoma of the cervix was three times as frequent, because other hospitals have closed down; the number of cases of carcinoma of the breast had, however, dropped considerably, perhaps because such patients are being sent to outlying hospitals. A large number of small, simple conditions were seen, and many soldiers were sent with rodent ulcers, plantar warts and the like.

The necessity for treating nearly all the superficial skin conditions by X rays instead of radium, he said, may not be a disadvantage. More use has been made of intrabuccal X rays, which are a valuable adjunct to radium. Four Metropolitan-Vickers tubes are giving excellent service, but it is practically impossible to obtain sealed-off glass tubes of the Siemens type. A British-made valve has been quite satisfactory, and he hoped the shortage and costliness of foreign apparatus would be a stimulus to British manufacturers. Dosimeters are now made by a new firm who employ a number of refugee experts. There is a shortage of radiotherapists, many of whom have gone into the army. If a proper war breaks out, the hardships associated with radiotherapy will be much worse and therapists must be careful not to let their technique deteriorate. If this happens, some grave accident will occur and radiotherapy will be retarded for several years. He thought decentralisation had more to be said against it than for it. Many hospitals cannot afford the expense of sending their machines out or of providing hospital and laboratory services in the country. Several hospitals, moreover, would object to losing their identity.

Dr. FRANK ELLIS outlined the precautions recommended by the National Commission—burying the radium in deep holes, or enclosing it in steel containers with a wall-thickness of not less than 3 in. Surface treatment can be carried out in such a way, he said, that the radium can easily be removed and put into a safe as soon as an air-raid warning is received. Radium used inside cavities or implanted could not, however, be removed so easily. The treatment of carcinoma of the cervix is one of the most hopeful branches of radium therapy, but should not be interrupted too much. Organisation and drill could ensure the radium being removed quickly. It is difficult, however, to keep these preparations at a sufficiently high level of efficiency, and intracavitary treatment should therefore be carried out in non-vulnerable areas. Implants are even more difficult to remove, and treatment that may be interrupted day after day will not be sound and accurate. The use of radon avoids many of the dangers, but the gas has disadvantages in treatment which were making its use less popular even before the war. Its intensity falls off quickly, and pumping is difficult to arrange at suitable times. The Holt Radium Institute at Manchester arranged for pumping to be carried out in a mine in the Peak district twenty-five miles from Manchester and seventeen from Sheffield. Radium therapy at country hospitals may be safe and continuous, but it is inconvenient to most of the patients and staff. Such hospitals are usually not big enough to accommodate their nursing staff or to arrange for frequent changes of probationers. The expense of equipment and running is, moreover, considerably greater than in the parent hospital. The Royal Sheffield Hospital and Infirmary had put all their radium down a borehole at the beginning of the war. After about a week the staff started again to treat carcinoma of the cervix and built up an organisation for instantly putting the radium into safety if an air-raid were signalled. This organisation, however, has fallen into decay. Grouping of areas is impracticable because of distance, but centres have been established for Sheffield and its district.

Dr. CONSTANCE WOOD dealt with radium-beam treatment in war-time. The Radium Commission, she said, regarded the breathing of radium dust as a real danger and drew attention to the incidence of lung cancer among pitchblende workers and watch-dial painters. If radium were dispersed by a bomb the whole site would have to be abandoned or carefully cleared of all debris, which, with some of the earth, would have to be carted away and buried by suitably protected workers. To recover the radium would be as expensive as mining an equivalent quantity. The commission, advised by its experts, therefore recommended that all the radium in the country should be placed at the bottom of fifty-foot shafts until the conditions of radiotherapy in war-time had been established. Four of these boreholes have been provided in London and about twenty others throughout the country, fitted with raising and lowering gear. Teleradiotherapy is the simplest form of radium treatment in war-time, for all the radium is stored in one container and, if a raid is signalled, the radium can be quickly lowered down the borehole. The small steel safe recently described by Prof. Sydney Russ (THE LANCET, Jan. 13, 1940, p. 98) is much cheaper and the wall is thick enough to prevent damage by high explosives. It weighs 120 lb. and will house a container holding 10 g. but not the applicators. In France radium treatment is being continued without interruption, and the Strasbourg centre is the only one that has been transferred. There is urgent need in this country for radium therapy to be continued. Many deaths caused by cancer could probably have been averted if emergency precautions had not interfered with treatment, and these would have to be added to the road deaths due to the blackout. As many radiotherapists as can be spared from the services ought to be sent back to their primary duty of treating cancer.

Dr. N. S. FINZI dealt with the treatment of war wounds by X rays. The irradiation of infected

injuries dates back, he said, to 1905, but it was not systematised until about 1926. Convincing evidence has been published by American and other foreign workers that the healing of clean wounds can be accelerated and keloid prevented. Infected wounds can be stimulated to heal more rapidly. Small doses are more effective; with large doses the healing is slower and more fibrous tissue is formed. The hardness of the rays seems to be immaterial provided that they can penetrate to the depth of the wound. No harmful effects can be caused by the best doses for this purpose. If treatment is given at the proper time—i.e., either immediately before or immediately after operation, 50 r is sufficient. The use of X rays in hospitals near the line may not be practicable, but in quiet hospitals they might be used as a routine. It would help to return many men to the line more quickly with better or softer scars. X rays are also valuable for wounds that will not heal, or heal slowly. A dose of 50 or 60 r with soft X rays, or 100–120 r with the γ rays of radium, may be repeated in four or five days and again in six or seven days. The resulting skin is generally soft and pliable. A zone of two or three centimetres round the wound should be irradiated as well. Ultraviolet rays have been used for the same purpose, but have little value in preventing keloid or in accelerating healing.

Dr. D. W. SMITHERS said that before the war the authorities were not prepared to use radiotherapy for war wounds. Its value in treating and preventing gas gangrene has hardly been realised in this country. It may have a place even though the army, to quote a War Office letter, "does not recognise the X-ray treatment of wounds." At his hospital 167 patients with injuries in various stages of infection have now been treated, with 16 deaths. These figures are encouraging. The true value of the treatment cannot yet be judged. It might perhaps not justifiably be made the first line of attack or used in all casualty clearing stations and hospitals on lines of communication, but in those cases where amputation is considered advisable because of infection, X-ray therapy has been most successful. The method should not be dismissed because some of the evidence is unsatisfactory. The evidence is better than that in favour of chemotherapy, and X rays do not produce agranulocytosis.

Lieut.-Colonel D. B. MCGRIGOR said that the War Office had given facilities for research in the X-ray therapy of gas gangrene.

Dr. A. E. BARCLAY ridiculed the panic which overtook the authorities at the beginning of the war and made them invent precautions against hypothetical emergencies to the complete neglect of real and urgent needs. There is, he said, no real evidence that a single inhalation of radium dust ever did any harm. A few workers with radium have been near tubes which have exploded, but they suffered no ill effect. The few cases in the literature were all in persons who had been subjected to chronic exposure. The belief in the ill effects of a single accident rests on physical and not on biological evidence, and takes no account of the very thorough excretion of radium. He would be perfectly willing to live on a plot of land over which radium had been exploded.

Dr. G. B. BATTEN said that as a general practitioner he now did not know what to do with a patient who required X-ray treatment; nor did he know who could tell him the best place to which to send the patient.

Dr. R. E. ROBERTS pointed to the necessity for leaving intact the band of experts who are now investigating radiotherapy. He would like assurance that there exists a pool of radiotherapists upon which large centres can draw. One of the disadvantages of radon is, he said, that surgeons who have already learnt how to use radium must now acquire a new technique.

Mr. T. A. GREEN said that radon could hardly be used with effect unless large centres existed to supply several hospitals.

Dr. R. R. MORRISON declared that interstitial treatment should only be carried out in safe areas. He had had some difficulty in convincing his colleagues of the seriousness of the danger.

REVIEWS OF BOOKS

Surgery of the Hand

By JOHN HAROLD COUCH, M.B. Toronto, F.R.C.S.E., department of surgery, University of Toronto and Toronto General Hospital. London: Humphrey Milford, Oxford University Press. 1939. Pp. 147. 7*s*.

THIS is not intended to be a textbook but rather a "manual discussing everyday problems which have been found troublesome" by the author in his extensive experience. The first part deals with injuries of the hand, and points out the immense value of proper early treatment, with cleansing, debridement and repair, but only after proper and detailed examination to exclude nerve and tendon damage. Early tendon suture is recommended if the operation can be performed under perfect conditions within four hours. Otherwise skin closure is advised, with tendon suture performed ten days later if there is no infection. The correct levels for amputations are described. The second part deals with infections. The general principles of treatment are laid down, with detailed discussion of the four main types of infection and their treatment. For tenosynovitis long lateral skin incisions are advised, with interrupted incisions in the sheath. It is doubtful if this is preferable to interrupted incisions in skin and sheath opposite the joints.

The book is profusely illustrated with excellent line drawings, each occupying a page, and the type is large and clear. It is easy to read, and the author has succeeded in squeezing a great deal of important information into a small compass without any impression of overcrowding. It can be recommended to students, practitioners and surgeons alike.

Atlas of the Commoner Skin Diseases

(2nd ed.) By HENRY C. G. SEMON, M.A., D.M. Oxfd., F.R.C.P., physician for diseases of the skin, and lecturer to postgraduates, Royal Northern and Hampstead General Hospitals. Photography under the direction of Arnold Moritz, M.B. Camb. Bristol: John Wright and Sons. 1940. Pp. 272. 42*s*.

IT is difficult to see how any practitioner can afford to be without this atlas. True colour photography is obviously the proper medium for illustrating dermatological subjects and anyone unfamiliar with the technique cannot appreciate the difficulties that photographer and the block-maker must have overcome to produce this magnificent set of pictures. The series of illustrations of syphilitic lesions are particularly interesting, but it is a pity that a plate showing a primary chancre could not have been included. Although the text which faces each illustration is brief, it is very readable and contains a great deal of valuable information. Particularly helpful are the many excellent suggestions

for treatment. In dealing with varicose dermatitis Dr. Semon does signal service by pointing out the untoward results that may arise if a varicose ulcer associated with dermatitis is treated with an elastic plaster bandage. No mention is made of the rapid response to M. & B. 693 of attacks of recurrent streptococcal dermatitis, or to the fact that pet birds may be a source of infection of molluscum contagiosum. Several diet regimes are given in connexion with the treatment of psoriasis, but there is no note of the low cholesterol diet which has proved useful in the hands of several authorities. Krysolgan, which is mentioned in the treatment of parapsoriasis, has not been manufactured for several years now. These omissions are, however, of trivial importance in a work of outstanding merit.

Les perforations digestives de la fièvre typhoïde

By JACQUES DOR, chirurgien des Hôpitaux de Marseille. Paris: Masson et Cie. 1939. Pp. 134. Frs.24.

THIS monograph gives a concise and practical account of the pathology, diagnosis and treatment of typhoid perforations of the intestine, which, though not so common in France as in England and the United States, are the cause nevertheless of "appréciables ravages." Early recognition and prompt surgical treatment are essential to success, for the case-mortality increases from 15 per cent. if the operation is done within twelve hours to 80 per cent. if it is delayed until the fourth day. Radiography may be helpful in diagnosis, but this is not difficult except in "chronic" perforation and in the perforation of a second ulcer after an operation has already been done. The best operation is simple suture, but enterostomy through the perforation, or exteriorisation of the perforated segment of gut may be desirable on occasion. Simple drainage, resection or short circuit are not on the whole to be recommended. The book contains a few well-chosen illustrations, and a useful bibliography.

Vade Mecum of Medical Treatment

(2nd ed.) By W. GORDON SEARS, M.D. Lond., M.R.C.P., medical superintendent, Mile End Hospital. London: Edward Arnold. 1939. Pp. 376. 10*s*. 6*d*.

FOR a small book this is remarkably complete, with a valuable selection of tables. One important condition alone seems to have escaped the author's attention—namely, empyema. On the whole Dr. Sears is a sound and valuable guide, for in addition to giving the didactic help needed he indicates the relative efficiency of the measures suggested and in a small compass shows the principles on which treatment is based.

An Introduction to Medical Genetics

By J. A. FRASER ROBERTS, M.B., D.Sc. Edin., F.R.S.E., principal investigator to the Burden Mental Research Trust, Stoke Park Colony, Stapleton, Bristol; special lecturer on human genetics, University of Bristol. London: Humphrey Milford, Oxford University Press. 1940. Pp. 266. 15*s*.

THIS excellent introduction provides an account of all forms of inheritance known to occur in man and a survey of the principal problems. From it the student will obtain a good working knowledge of the theory of inheritance, and, unless he is dull indeed, an interest in the subject and a wish to explore the genetic aspects of the medical questions which face him in his daily life. Each theoretical point is amply illustrated by examples of morbid conditions of known heredity found in man, so that the reader will be equipped with a knowledge of the part played by heredity in a great variety of abnormal conditions. A sensible feature of the book is the exclusion of all reference to the history of genetics and to plant and animal genetics. Our knowledge of human genetics has now advanced so far that this omission does not impair the completeness of the presentation of the theory of inheritance. Human genetics can never be divorced from general and experimental genetics, but it has now become a largely independent science with a wide and systematic body of knowledge. The only expansion one would wish to see in later editions would be a more detailed discussion of the hereditary aspects of some of the commoner morbid conditions. For this to be possible, however, further advances in research will have to be made. This book should do much to stimulate such research.

Yearbook of Obstetrics and Gynecology

Edited by JOSEPH B. DELEE, M.D., professor of obstetrics, University of Chicago medical school; and J. P. GREENHILL, M.D., F.A.C.S., professor of obstetrics and gynecology, Loyola University medical school. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1940. Pp. 736. 12*s*. 6*d*.

THIS edition does not fall behind the high standard of its predecessors. As valuable as the synopses themselves are the pithy and considered comments of the two editors, which must represent a great deal of hard labour. For the most part the articles selected are taken from the American literature, but they represent a fair cross-section of work done in other parts of the world. No-one who practises the art of obstetrics or gynæcology should fail to read this book and keep it handy for reference.

Bacteriology

By WILLIAM W. FORD, M.D., D.P.H., emeritus professor of bacteriology, school of hygiene and public health, Johns Hopkins University. London: Paul B. Hoeber. 1939. Pp. 207. $2.50.

IT is curious that despite its recent and rapid development so little has been written on the history of bacteriology. Professor Bulloch's chapter in the "System of Bacteriology," later enlarged to book form as the Heath Clark lectures, filled this gap. Now from America comes what may be termed a popular abridged edition of Bulloch; for it is obvious, as the author acknowledges, that much of the information has been derived from Bulloch's classical researches. There are few inaccuracies; the acid-fast staining of the tubercle bacillus is attributed to Koch instead of Ehrlich, and there is the common error of tacking on an extra "s" to the name of Semmelweis. The merits of the book, which is one of a series on the history of medicine, are its pocket size and pleasant style, so that it can be recommended as a week-end book for the interested layman or as a primer for the medical graduate and undergraduate.

Seelischer Gesundheitsschutz

Eine Einführung in Diagnostik, Forschung und Nutzanwendung der Psychohygiene. By HENRICH MENG. Basel: Benno Schwabe and Co. 1939. Pp. 223. Swiss Frs.8.

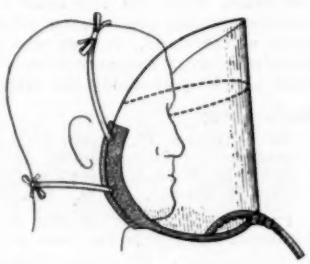
No-one who writes a textbook of mental hygiene can hope to be precise: he can indicate important general principles, point to the damage done by ignorance or flouting of these principles and include details of psychiatric diagnosis and treatment. But the major issues—how to forestall mental illness, whether neurotic or certifiable, and how to lessen its severity and frequency—cannot be dealt with by such definite

measures as can be advocated say for infectious diseases or those due to malnutrition. The writer on mental hygiene must tend, therefore, to express either unexceptionable and often woolly platitudes or optimistically confident assertions about the benefit to be obtained by applying to prophylaxis the methods of psycho-analysis, child guidance or other therapeutic procedure. Dr. Meng has done his best to put the opportunities and achievements of mental hygiene honestly. He is disposed to accept Freudian views but does not omit reference to alternative theories and treatment. The chapter on alcoholism is in some respects typical of the book. It contains undeniable statements on matters which are unfortunately often overlooked by those without psychiatric training; it gives lengthy and interesting—but quite deniable—psycho-analytic formulations; and it leaves the reader in the dark as to what chance he or anybody else has of curing a bad alcoholic or of stopping an occasional drunkard from becoming an inveterate one. Dr. Meng does not make sufficiently clear how ineffectual our therapeutic resources often turn out to be in cases of alcoholism. In short, he tells a rosy, prosy, Freudian tale which is of little practical value. But not all the subjects discussed are as difficult to cope with as alcoholism. The three parts of the book deal respectively with general questions of diagnosis and treatment (as well as the scientific status of mental hygiene), observations on the sick, and the application of the foregoing to education and the problems of later life, and much of these are of practical value, especially to psycho-analysts.

NEW INVENTIONS

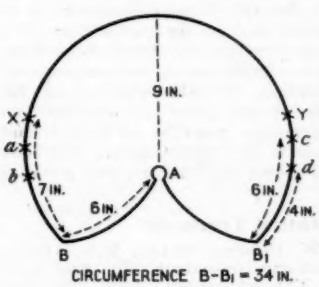
AN IMPROVISED MASK FOR ADMINISTERING OXYGEN

IN view of possible difficulties in obtaining adequate supplies of apparatus for administering oxygen, details of a mask invented and made by us for use at Claybury Emergency Hospital may be useful. Its cost is negligible, and it is easily and quickly made by an unskilled person out of ordinary hospital materials. It consists essentially of an irregular cone of light transparent plastic material, part of its base fitting closely from under the chin up to in front of the ear on each side, and the part above standing well away from the forehead (fig. 1). Oxygen is delivered through rubber tubing at the bottom of the mask, where the patient's nose and mouth rest virtually in a pool of oxygen; expired air passes out freely through the open space above.



The mask is made from a discarded non-inflammable X-ray film (15 × 12 sq. in.) from which the emulsion has been sponged off after soaking in warm water. (Transparent Rhodoid, 3/10 mm. thick, or any similar cellulose-acetate fabric can be used; these materials are only slightly inflammable and can be cleansed by sponging with warm water.) The film is cut according to the pattern shown (fig. 2). The edges AB and AB_1 are sewn together with strong linen thread, a straight cutting needle and a "cat's-tooth" stitch being used preferably. The points B and B_1 being now in apposition and the film being moulded into a rough cone, a copper wire, gauge 20, is oversewn along the edge XBY, and strong tapes, 15 in. long, are stitched to this wired edge at the points *a*, *b*, *c*, and *d*. At the end of a yard length 3/16 in. rubber tubing four holes are cut at intervals of 1/3 in.; this end is drawn into the mask through the aperture at the apex of the cone, and fixed with two stitches to the seam AB in such a position that it arches upwards inside the mask, its holes facing the seam. A strip of lint, 14 × 2 sq. in., folded lengthwise into three, is fitted as padding along the inner surface of the wired edge XBY, projecting about ½ in. beyond the edge, and held in position by inch-wide adhesive strapping, one strip on the inner and one on the outer surface. (The lint and strapping can be stripped off and renewed when soiled.) Finally, the seam AB and the place of entry of the tubing are made airtight with adhesive strapping applied to the outer surface.

The mask is put on with the point B under the chin and X and Y in front of the ears, the wired edge being moulded to fit the contours of the face and chin. The upper tapes are drawn vertically upwards and tied well forwards on top of the head, while the lower tapes pass back horizontally below the ears. If the wired edge is properly moulded, the mask will lie easily in position without causing uncomfortable pressure or tightness. The draught of oxygen generally prevents any feeling of stuffiness at delivery-rates of over 3 litres a minute. If, however, the mask is stuffy and hot, its upper edge may be cut down to the level of the forehead (fig. 1, dotted line), this giving increased ventilation without much loss of efficiency. To prevent condensation on the inside of the mask, it should be treated with an anti-mist preparation or simply with soap.



The concentrations of oxygen in the lower part of the mask and in the alveolar air at different speeds of delivery and in different subjects were estimated for us by Mr. Juby, of Messrs. Charles King Ltd., as follows:—

Rate of flow of oxygen	Percentage of oxygen in—	
	Inspired air	Alveolar air
3 litres a minute	40–45	35–40
4 ,, ,, ...	50	40–45
6 ,, ,, ...	55–60	50

A more finished pattern of mask is being made by Messrs. Charles King Ltd., of Devonshire Street, W.1, with rhodoid and a padded rubber fitting for the face.

ALICE ROSE, M.B. N.Z., M.R.C.P.
T. HOLMES SELLORS, D.M. Oxfd
Claybury Emergency Hospital.

THE LANCET

LONDON: SATURDAY, APRIL 6, 1940

THE ACUTE SINUS

THE papers read before the clinical congress of the American College of Surgeons at Philadelphia [1] illustrate how the attitude towards acute sinus infection has changed as knowledge of its natural history has become more exact. The advances in physiology for which PROETZ of St. Louis has been largely responsible have led to a growing respect for the natural defences and more particularly for the cilia. The nasal cavities and accessory sinuses are lined by a ciliated and mucus-secreting membrane, and the cilia are so arranged that they carry the mucus from the sinuses out through the openings into the nose and thence into the nasopharynx where it is swallowed. Thus dust and bacteria in the inhaled air are caught by the mucus like midges on a fly-paper and carried away to face the destructive action of the intestinal ferments. This is the first line of defence for the air-passages. Excessive secretion or pus in the nose or sinuses is removed in the same way. A good current of air through the nose is an important accessory mechanism. It is essential to preserve these activities as far as possible and not to hinder them by over-energetic therapeutic measures.

General conditions predisposing towards sinus disease are lowered resistance, improper hygiene, faulty diet and allergy. Each to some extent interferes with ventilation and drainage by producing congestion and swelling of the nasal mucous membrane or drying of the nasal secretions. Local factors are anatomical abnormalities such as a badly deviated septum or adenoid overgrowth, sepsis in neighbouring organs, especially the tonsils, and narrowed anterior nares hindering the flow of air. The organisms responsible for the condition are those commonly present in the nose or throat either as primary invaders or secondary to a virus infection such as influenza or measles. The commonest is the streptococcus. The inflammatory process causes vascular engorgement of the mucous membrane and excessive secretion. The swelling reduces the circulation of air both in the nasal cavities and sinuses, and the cilia, partly disorganised by the catarrh of the cells from which they arise, are now faced with the task of removing an extra amount of secretion in unfavourable conditions. The catarrhal phase becomes a purulent one, but pus does not of itself inhibit ciliary action. The frontal sinus, anterior ethmoidal cells and maxillary sinus drain into the middle meatus by small and easily obstructed openings separated only by a centimetre or so. Swelling of the mucous membrane of this area of the middle meatus may result from the drainage of pus from any one of the sinuses. Partial or complete occlusion may also be caused by inspissated pus. By whatever method the obstruction is produced headache may follow, for if there is active infection the secretion formed cannot be removed by the cilia and intrasinous pressure rises. If, on the other hand, there is only slight infection, the air in the sinus is absorbed and a negative pressure is set up giving rise to the "vacuum headache" described by SLUDER. A frontal headache is thus not always due to an infection of that sinus. However it arises the headache typically has some peculiar characters. It comes on in the morning when the patient awakes, reaches a maximum about noon, and gradually disappears in the early afternoon. It is an unpleasant nauseating pain and very incapacitating. In addition, neuralgic pains may be felt in any part of the distribution of the trigeminal nerve and even referred to some of the cervical nerves.

The patient with acute sinusitis will get well most certainly and rapidly if he stays in bed. Unfortunately he is rarely willing to do this unless forced by headache or severe constitutional symptoms. As well as the usual general methods employed in dealing with acute sepsis sulphanilamide is valuable in streptococcal infections. It must be given in full doses from the outset for a maximum effect, and its possible toxic action should always be remembered. Vitamins A, B, C and D are useful and many preparations are now on the market containing all four. Alkalis are supposed to be helpful. Allergy should be suspected when a large number of eosinophils are present in the nasal secretions. If the allergen can be discovered specific treatment may reduce the turgescence of the nasal mucosa and by improving aeration may assist the natural processes of cure. Finally, the patient should avoid badly ventilated rooms. In prescribing local measures the utmost care must be taken to avoid damage to the cilia. Ventilation and drainage of the sinuses must be secured and the inflammation treated by heat. Diathermy or short-wave irradiation are convenient ways of applying heat—claims of a more specific action have not yet been proved. Ephedrine and cocaine in weak solutions have been shown to do no harm to the cilia. A spray of ephedrine sulphate 0·5 per cent. in isotonic saline has a prolonged astringent action and can be used every four hours together with a steam inhalation containing not more than a grain of menthol in a pint of water. Patients often find the local application of chloretone in liquid paraffin soothing, but the cilia do not work well in this medium. If pus is still present in the maxillary sinus after three or four days of conservative treatment, especially if there is much pain, antral puncture and lavage should be

1. Hill, F. T. *Surg. Gynec. Obstet.* Feb. 15, 1940, p. 531; Orton, H. B. *Ibid*, p. 534.

performed under a local anæsthetic. With care this should not be painful, and most patients are so relieved by the operation that they do not object to its repetition. It is sometimes necessary to catheterise and wash out the frontal or sphenoidal sinuses but these are manipulations for the specialist. The fundamental principle is to assure free ventilation and drainage but to treat the mucous membranes gently.

POTABLE WATER FROM THE THAMES

NEARLY two-thirds of London's water comes from the Thames and it is well from time to time to consider the facts which justify the confidence with which Londoners drink river water. These are set out by Lieut.-Colonel E. F. W. MACKENZIE in a chapter entitled The River Thames as a Source of Potable Water contained in his first report [1] as director of water examination. The custom of drinking Thames water is very old-established and when Tobias Smollett wrote "Humphrey Clinker" he was aware of the gross pollution of the tidal water which was then used for supply. Even after the intake was transferred to a site above Teddington lock the insanitary habits of up-stream communities still led to suspicion of the Thames-derived supplies to the metropolis. It was in fact the proposal to bring water from Wales which led to the formation of the Metropolitan Water Board. But the Thames prevailed and while it is amazing that the river should still be used as a source of potable water for such a city as London it is a still more amazing testimony to the self-purification of natural water and to the skill and judgment of those who add the finishing touches to Nature's work. Since 1934 monthly chemical and bacteriological examinations have been made of samples of water taken at eight stations from Tilehurst, a mile or so above Reading, down to the Littleton intake. These show that the quality of the river water is much the same throughout despite the contributions, visible and invisible, of land water and sewage effluent from five thousand square miles of watershed above the intakes. Taking the total hardness as a measure of mineral content the average for each of the eight stations varied only from 22·7 at Hambledon lock to 23·0 at the two highest and the lowest station on the stretch examined. The only inorganic evidence of concentration of pollution was the rise in chlorions from 1·71 parts per 100,000 at Tilehurst to 2·09 at the intake. Evidence of organic pollution was on the whole greater at the lower stations, but the results were of the same order as at the highest. The bacterial flora remains constant. There may be some indication of a fall in purity at Sonning bridge, followed by improvement at Hambledon lock and Bourne End, with a second deterioration at Ruddle's pool which is maintained down to the intakes, but this cannot be seen in the chemical results. Seasonal changes are in fact much more pronounced than regional changes and the degree of pollution closely follows the natural flow of the river as recorded at Teddington weir. This has its explanation in the fact that the Thames throughout its course flows through and drains, directly or by means of its tributaries, land which is entirely covered with soil. Activated silt, like activated sludge, converts much of the organic matter in solution into insoluble matter and into nitrates. Bacteria find conditions less favourable than in relatively concentrated sewage, and light is unfavourable to their growth. In a slowly flowing river the conditions of equilibrium for both chemical compounds and living organisms are much the same all along its fresh-water course.

1. Metropolitan Water Board. 33rd annual report of water examination. London: P. S. King and Son. 10s. 6d.

HÆMORRHAGE IN THE NEWBORN

SEVERE bleeding in a newborn baby is one of the emergencies which sooner or later everyone who practises obstetrics must face, and he must be in no doubt about the right course to pursue. The recent work on vitamin K [1] may have done more to complicate than simplify his decision. Some degree of bleeding is not uncommon—SALMONSEN [2] encountered it in 66 of 9748 infants born alive in the Oslo University Clinic, and of these 14 died. It is probable that the bleeding may start directly after birth, but the condition only becomes manifest on the second or third day; at this time the coagulation-time of even the normal child rises to a maximum, to fall again to normal by the tenth day. The commonest first symptom is the passage of a large tarry stool, but the onset may be ushered in by hæmatemesis or bleeding from the umbilicus, extreme pallor, or the rapid enlargement of a cephalhæmatoma. Some say that intracranial hæmorrhage may also be a manifestation of the disease. In severe cases the bleeding continues—the quantity of tarry or red blood passed in the stools may be almost unbelievable—the pallor becomes intense and the child dies on the fourth or fifth day. In mild cases recovery is rapid, but unfortunately it is impossible to say in any given case that severe symptoms will not develop later. Hence even slight bleeding calls for prompt and energetic treatment.

Recent observations have related the increased coagulation-time which is associated with most cases of hæmorrhagic disease (though apparently not in all) to deficiency of prothrombin, the result of inadequate storage of vitamin K, and the administration of that vitamin promptly raises the prothrombin level to normal. Moreover, the fall in prothrombin can be prevented by giving the baby vitamin-K concentrate by mouth or even by giving it to the mother for not less than 24 hours before delivery. The return to normal of the coagulation-time by the tenth day cannot however be explained by the vitamin K ingested in the baby's feeds, for they do not ordinarily contain enough for that purpose. ALMQUIST and his

1. See *Lancet*, 1939, **2**, 1178.
2. Salmonsen, L. *Acta pædiatr., Stockh.* 1939, **27**, suppl. 1, p. 1.

colleagues [3] have shown that bacteria readily synthesise vitamin K and SALMONSEN [4] and DAM and others [5] have suggested that the prothrombin deficiency is related to delay in the production of vitamin K by bacteria in the intestine. This might explain JAVERT'S [6] observation that hæmorrhagic disease is twice as common in babies born in the New York Hospital, where feeding would be according to the most sanitary methods, as in babies born at home. This view is supported by SALMONSEN and NYGAARD'S [7] finding that supplementary feeds of cow's milk in addition to the breast prevent the normal fall in prothrombin level. The early feeding of the newborn infant may therefore play a part in preventing the hæmorrhagic disease.

Since infants have been cured of their hæmorrhagic tendency within a few hours by the administration of vitamin K [8] or 2-methyl-1 : 4-naphthoquinone [9] the question arises whether the practitioner faced with a case should adopt this treatment, since supplies of vitamin K are now on the market. The answer seems to be that he should not. Our experience is not yet sufficient to justify dropping the simple remedy that has proved its efficiency—namely, the administration of blood. The results of this measure are among the most striking in therapeutics. The best way of giving the blood is the intravenous injection of 50 c.cm., but 20 c.cm. injected into the buttocks, when no typing is required, each day for two or three days is almost equally successful and can be relied on in all but the worst cases. Vitamin K may, of course, justifiably be used in hospital, where it can be rapidly followed by blood-transfusion if necessary. And by way of prophylaxis there is evidence to support the routine administration of the vitamin to the mother for a short time before and after labour, the early commencement of feeding, and the intramuscular injection of 5 mg. of 2-methyl-1 : 4-naphthoquinone to the infant.

3. Almquist, H. J. and Stokstad, E. L. R. *J. Nutrit.* 1936, **12**, 329. Almquist, Pentler, C. F. and Mecchi, E. *Proc. Soc. exp. Biol., N.Y.* 1938, **38**, 336.
4. Salmonsen, *Acta pædiatr., Stockh.* 1939, **32**, suppl. 1.
5. Dam, H., Tage-Hansen, E. and Plum, P. *Lancet*, 1939, **2**, 1157.
6. Javert, C. T. *Amer. J. Obstet. Gynec.* 1938, **35**, 200.
7. Salmonsen and Nygaard, K. K. *Acta pædiatr., Stockh.* 1939, **27**, 209.
8. Nygaard, *Acta Obstet. Gynæc., Scand.* 1939, **19**, 361.
9. Macfie, J. M., Bacharach, A. L. and Chance, M. R. A. *Brit. med. J.* 1939, **2**, 1220.

ANNOTATIONS

THE CHILD'S HOME BACKGROUND

WITHOUT happy and affectionate home-ties children feel insecure and the stability of their future emotional relations is endangered. In recent years child psychiatrists have shown that the key to the understanding of difficult and neurotic children lies in the home, and particularly in how the members of the family feel towards each other. Thus D. R. MacCalman,[1] amongst others, has found that a large number of difficult children are hated by their parents. This hatred is far more often unconscious than conscious, and the parents are neurotic. But even when unconscious, hatred and rejection have a very damaging effect on the character of the small child whose need for affection is urgent. The jealousy which they engender, although a normal emotion in children, is apt to be misunderstood and intolerantly handled. There are in fact powerful emotional forces at work and unless they are understood far-reaching mistakes can be made in these days of evacuation, when 400,000 school-children have been reft from their homes and placed in those of strangers. In a booklet recently published,[2] an attempt has been made to elucidate these problems for the benefit of all those, medical and lay, who have suddenly found themselves faced with the difficulties of uprooted children, deprived parents and harassed foster-parents. How does it feel to a child to be suddenly removed from familiar faces and familiar places for an indefinite time? How does it feel to have someone else's children billeted in one's house? How does it feel suddenly to find the house empty and silent, with no children to put to bed and get off to school next morning? Unless we can answer these questions, we cannot understand the nature of the problems of evacuation and billeting.

Children are excellent dissemblers, and the extent to which they miss their parents and homes is apt to be under-estimated. Some years ago D. W. Winnicott [3] drew attention to bedwetting as a symptom of depression. Much, though by no means all, of the bedwetting of the early days of the evacuation was an expression of the child's apprehension at leaving home, which was often increased by the child's distressing habit of misinterpreting events. From all areas have come reports of children fearing that their homes and parents were being bombed and of younger children jumping to the conclusion that their mothers had sent them away for being naughty. It is misconceptions of this kind which, added to loneliness, account for the excessive anxiety and often hidden depression felt by some of the children. Recent research, moreover, has demonstrated the great importance of home ties to even very small children, and in a letter in our columns J. Rickman [4] drew attention to the disturbing effect which being sent away from home may have on the development of the small child's personality. J. Bowlby [5] found such interruptions and separations in the histories of more than half of a group of persistent juvenile offenders. When compared with a group of non-offenders, the difference was statistically significant.

The scientific study of family life is still in its infancy, but it should already be recognised that no worker, whether medical or lay, is properly equipped to deal with these problems without training. Evacuation is essentially a family matter, yet no attempt has been made to enlist the help of workers who have specialised in this field, while child psychiatrists are manning blood-transfusion stations, and professional social workers standing by practically idle. Nor is it reassuring to find that on the newly appointed Advisory Committee on Evacuation there is no representative of pædiatrics, of child psychiatry or of the professional social workers. It is to be hoped that before further plans are made these omissions will be remedied.

1. *J. R. sanit. Inst.* February, 1940, p. 301.
2. Children in Wartime, obtainable from A. Brown and Sons, Perth Street West, Hull, or from the *New Era*, 29, Tavistock Square, London, W.C.1. 7*d*.
3. *Proc. R. Soc. Med.* 1936, **29**, 1515.
4. *Lancet*, 1932, **2**, 1192.
5. *Brit. med. J.* 1939, **2**, 1202.

BODY-FLUIDS IN EPILEPSY

THERE has been a good deal of discussion about the relation of the water and acid-base balance of epileptic patients to their fits. Lately the observation that antidiuretics and a large fluid intake increase while diuretics and restricted fluids decrease the number of fits has supported an earlier finding. One of the characteristic changes previously described is that body-weight rises before a fit and falls after it. Greville, Jones and Hughes[1] have worked out the relations between body-weight, fluid intake and output, gain and loss of metabolic water, variations of insensible water loss and such like in detail for three patients and a normal control over a period of months, during which all four were kept on standard diets. They suggest that the weight changes observed are due to changes in the water content of the body, and that the retention is most probably in the bloodstream, because the total nitrogen and total solids of the blood fall as the water excretion rises and vice versa. The rise and fall in weight before and after a fit occurred however in rather less than half the fits observed; in the remainder there was a negative water balance. This inquiry settles the relation between weight changes and body hydration, but it does not explain the relation between hydration and seizure frequency.

Gibbs, Lennox and Gibbs[2] have investigated the carbon-dioxide content of arterial and venous blood in epileptics. They divide their case material into three classes—the grand-mal type, the petit-mal type, and a mixed type, in which there are both grand- and petit-mal fits. They found that the grand-mal type have a high carbon-dioxide content in the blood, the petit-mal type a low one, and the mixed type a range similar to that of the normal controls. There is also an abnormal fluctuation in the carbon-dioxide of the blood in epileptics. A simultaneous study of the oxygen content shows that the abnormally low level of carbon-dioxide before a petit-mal fit and the rise after it do not depend on changes in blood-flow or in tissue oxidation in the brain. With grand mal there is a steady rise for several days before a fit when there is a fall; they could not determine whether the fall takes place with or before the fit. The carbon-dioxide level then rises again until another fit occurs and so on. The grand-mal picture is thus the converse of the petit-mal, and this is strikingly borne out by the electroencephalograph. The records from this instrument are distinct for the two types of seizure. In the grand-mal type there is a train of fast waves, while the energy in the petit-mal encephalogram lies in the slow waves. Moreover, raising the carbon-dioxide content of alveolar air or internal jugular blood increases the frequency of the brain waves, and lowering it reduces their frequency, whether the wave pattern is normal or abnormal. The fluctuation in carbon-dioxide content is elaborated by Nims and his colleagues[3] who have demonstrated that on over-breathing the carbon-dioxide level of the blood drops further and stays low longer in the epileptic than in the normal person. Overbreathing is known to be a factor in precipitating petit mal, and they have traced the course of the three variables, base bicarbonate, pH, and carbon-dixoide tension, by plotting them triaxially (using the method of Shock and Hastings) after a period of overbreathing. Blood samples were taken at short intervals, and the course of the three variables was found to be typical. The normal traces out a loop which is small and narrow, showing relatively little alteration in the acid-base balance, while the petit-mal epileptic produces a loop which is large and wide, indicating a shift toward a fixed acid acidosis. The mechanisms which regulate the physico-chemical state of the fluids of the body, and hence of the brain, are thus impaired in petit mal so that they are not able quickly and adequately to adjust the acid-base balance when it is disturbed. These two papers make it clear that in epilepsy there is an instability of the acid-base balance, with different pictures for the two types of epileptic fit. Moreover, they have established that there is some inherent difference in the reaction of the epileptic since the physico-chemical changes produced by overbreathing will precipitate an attack of petiti mal in an epileptic but not in a normal person. Finally, artificial changes in carbon-dioxide content will not precipitate a fit unless they are more extensive than those observed in a spontaneous fit.

1. Greville, G. D., Jones, T. S. G. and Hughes, W. F. G. *J. ment. Sci.* 1940, **86**, 195.
2. Gibbs, E. L., Lennox, W. G. and Gibbs, F. A. *Arch. Neurol. Psychiat.* February, 1940, p. 223.
3. Nims, L. F., Gibbs, E. L., Lennox, W. G., Gibbs, F. A. and Williams, D. *Ibid*, p. 262.

EYESTRAIN IN INDUSTRY

THE illumination of factories and workshops is at last receiving the attention it deserves from industrial welfare officers, and it formed the subject of a leading article in the February number of *Aircraft Production*, the journal of the aircraft manufacturing industry. The lighting requirements of various types of work are very variable and it is essential that engineers and architects planning the lighting of workshops and offices should be guided by the need of individual workers or teams of workers rather than by the claims of symmetry. For instance, the intensity, quality and background of the lighting required are quite different for workers who are painting aeroplane wings and for those engaged on fine adjustments of parts of an engine against a micrometer. For the former a diffuse even illumination of moderate intensity is adequate, whereas the latter need powerful focal illumination from an appropriate source near the work but not shining directly into the worker's eyes, with a subdued background. For work requiring concentrated visual attention to detail careful photometric readings should be taken of the intensity and quality of light that allows the workman to do his job efficiently with the least fatigue. Glare and too great an intensity of illumination as well as insufficient lighting are causes of retinal fatigue. Laymen often express concern about the possibility of causing progressive and permanent damage to eyesight by working under artificial light. It is true that some adult myopes may have their refractive disorder increased by long hours of close work under insufficient illumination when their general health is below normal, but in the case of low and moderate degrees of myopia this does not impair their sight when corrected by appropriate glasses. It is also a fact that people with unstable binocular muscle balance and convergence and accommodation weakness who have had no symptoms when employed out of doors may suffer from headaches, eyestrain and inability to concentrate when their occupation is changed to close work. These muscular deficiencies do not lead to impairment of vision but are the cause of a breakdown and inability to continue close work. The worker's general health, in particular his opportunities for outdoor exercise, regular meals of good food, relaxation, sleep, interest in his work and his psychological make-up, as well as the air and lighting of his workshop, are factors in causing an ocular breakdown. Certain ocular aids such as polaroid glasses, for use on highly polished surfaces, binocular magnifiers, tinted lenses and other protective devices serve

a useful purpose in industry. The ideal could be realised by a thorough and careful preliminary eye examination of all workers to detect refractive errors and muscle imbalances and insufficiencies as well as ocular disease. Workpeople could then be grouped according to their ocular fitness for certain types of work. Industrial investigations should be made on the optimum conditions of lighting and posture for the workman. Many data would have to be collected before any definite opinion could be passed about the effect of certain forms of work on the eyes and the incidence of industrial ocular fatigue. Such a study would require the coöperation of the physiologist, physician, psychologist, ophthalmologist and social-welfare worker.

SHAPE OF THE FEMALE PELVIS

For some years there has been a growing realisation that all was not well with the accepted classification of pelvic deformity in women. Certainly knowledge was lacking about the effect of the bony pelvis on the course of labour. For practical purposes the pelvis has been looked upon as consisting of an inlet and an outlet. Any variation in the size and shape of the former has commanded attention, especially in regard to its measurement and relationship to the position of the fœtal head, and a special but rarely seen mechanism was devised for the passage of the fœtal skull through the flat pelvic brim. The contracted pelvic outlet received less attention, probably because it was more difficult to detect. Usually the diagnosis was made at the time of an obstructed labour. For some reason it was thought to be associated for the most part with a kyphosis of the spine, an entirely erroneous supposition. This was the state of affairs in the majority of teaching centres before Caldwell and Moloy [1] began to publish their papers on the subject. Their investigation was aided by pelvic radiography and they made use of the precision stereoscope, whose value is now established wherever it has been employed. The variations of the female pelvis, they suggest, should be classified into four main types, the anthropoid, gynecoid, platypelloid and android, intermediate types being common. This classification in itself is important, but Caldwell and Moloy next direct attention to the necessity for considering the pelvis not merely as an inlet and an outlet but as a bony birth-canal, in which deformities or obstructions may be met with at any level or plane. They put forward a plan for the accurate analysis and assessment of information obtained by radiography of the shape and capacity of the whole bony canal. Lastly they consider the influence of the pelvic shape on the course of labour and any obstetrical manipulations that may be necessary to assist delivery. Their views provide an explanation, hitherto absent in textbooks of obstetrics, of phenomena that have been observed times without number. For example, it has been accepted that the fœtal skull only assumes the persistent occipito-posterior position if it is poorly flexed when it reaches the pelvic floor. Yet all who practise obstetrics have constantly had to examine and deliver the fœtus in that position when the head was most certainly fully flexed. This has not been an error in judgment or diagnosis. The explanation is forthcoming in a study of the bony birth-canal in the android pelvis. Caldwell and Moloy have made a useful contribution to our knowledge of pelvic variations and have also brought out the necessity for a thorough and intelligent investigation of each bony pelvis. Nevertheless they have made it clear that too much attention need not be directed to minor deformities. These will usually give rise to no trouble, provided that strong physiological uterine action is not replaced by the feeble, irregular contractions that are often the products of misguided attempts at the induction of premature labour.

1. Caldwell, W. E. and Moloy, H. C. *Edinb. med. J.* 1939, **46**, Transactions 1, 37.

LIGATURE OF THE PATENT DUCTUS ARTERIOSUS

Congenital deformities supply an obvious field for constructive surgery, and much has been achieved in it, especially by plastic and orthopædic surgeons. But the problems of cardiac malformation have remained without a single solution until Gross [1] announced successful ligature of the patent ductus arteriosus in 4 cases, more than thirty years after Munro [2] first suggested its possibility. The ductus Botalli commonly remains patent to compensate for some more serious abnormality, and then its surgical obliteration would clearly be undesirable, but in 92 of the 242 cases reviewed by Abbott [3] it was the sole cardiovascular lesion. As many as 28 of these patients died of infective endocarditis, 40 of heart failure and 2 of rupture of the ductus, and their average age at death was twenty-four years. Apart from its threat to life the lesion may shunt enough blood from the aortic circuit seriously to impair a child's nutrition. From these considerations Gross formulates his criteria for operation, and rightly insists that the mere diagnosis of an uncomplicated patent ductus is not enough to warrant intervention. In short, he requires evidence that the ductus is enlarging, that a child is not developing properly or that the heart is carrying an increased burden. The threat of infective endocarditis always remains to be thrown into the scale against delay.

Gross worked out his method of approach by study of the human cadaver and experiments on living dogs. He found that a good view of the ductus was obtained by entering the thorax through the left pleural cavity and temporarily collapsing the lung. The mediastinal pleura is then incised to expose the pulmonary artery and aortic arch, and dissection of the fat and areolar tissue filling the sulcus between them follows, a procedure requiring great care and patience which in one case took nearly two hours. It was found crucial here to isolate the recurrent laryngeal nerve, not only to avoid injuring it but also because it leads surely to the ductus. Added difficulty may be caused by a high reflection of the pericardium or by the ductus being unusually thin-walled. In one case the wall tore, and death was only averted by superb nerve and skill and by an immediate blood-transfusion. Before actual ligature a temporary occlusion for two or three minutes was practised in order to gauge its effect on the circulation. Gross's four patients, who were aged seven, eleven, seven and seventeen years, all recovered rapidly, and there were no postoperative complications. The thrill disappeared in every case. In the first two a faint to and fro murmur persisted, but in the second two, with a change in technique from single to double ligature, the murmurs were abolished. In every case the low preoperative diastolic pressure was restored to normal, and the heart lost its tumultuous action. In two cases blood-flow studies were made by taking samples of blood for oxygen content from the aorta, the ductus, the main pulmonary artery and the left pulmonary artery before and after ligature of the

1. Gross, R. E. *Trans. Amer. surg. Ass.* 1939, **57**, 8.
2. Munro, J. C. *Ann. Surg.* 1907, **46**, 335.
3. Abbott, M. E. Congenital Heart Disease. Nelson's Loose Leaf Living Medicine, vol. iv, p. 207.

ductus. In one of these a left ventricular output of 24·6 litres a minute, of which no less than 18·8 litres was found to be lost through the ductus, was reduced to 5·08 litres by the operation, figures which show clearly how greatly it can increase cardiac efficiency. Those who follow Gross's lead will be wise to keep to his cautious criteria of operability until further experience justifies their modification.

ON LEAVING THE MENTAL HOSPITAL

A USEFUL start towards the systematic rehabilitation of patients discharged recovered from mental hospitals is reported by Wootton and Minski [1] from St. Ebba's Hospital. They found that the difficulty of finding employment was, in many cases, the chief factor in bringing about a relapse and conversely that patients who could be helped to obtain suitable jobs after discharge did well. A certain number of patients can be discharged home and find employment for themselves; others, because of prejudice against them or because the competition in their particular trades is too great, cannot get work and many of them have no home or resources of their own. For these a scheme was started in 1935 towards which a grant was obtained from the mental hospitals committee of the London County Council. The patients discharged home are followed up at an outpatient clinic and those who have difficulty in getting work are referred to a social worker of the Mental After-Care Association which is collaborating in the scheme and has a special department for employment finding. Other patients are boarded out either at mental aftercare hostels which are specially suitable for the social rehabilitation of the convalescent patient, at Church Army or similar hostels, or in selected lodgings until a job is found. In only a few cases has it been possible for a patient to find a job before leaving the hospital, partly again on account of public prejudice. For patients whose trades are overcrowded, or whose former jobs were unsuitable from a psychiatric point of view, training for different work is arranged. Suitable patients are picked out and before he is sent for training the potentialities and experience of each patient are considered at a conference between the medical staff of the hospital and an education expert. The training is carried out at various polytechnics and training centres; some patients attend from their homes, some from hostels, and some from the hospital itself. Thirty-one patients have so far been placed in jobs, of whom twenty were men and eleven women. There were among them schizophrenics, depressives, epileptics and alcoholic psychopaths, and the jobs for which training has been given include shoemaking, electrical engineering, nursing and secretarial work. Nine of the thirty-one were trained in new trades; twenty-five of the total number remain well and in work, four have relapsed, one committed suicide and one is in the hands of the police. Such a scheme makes new demands on the hospital staff and the social worker and calls for a certain financial outlay, but it is the logical development of the occupational-therapy department in the hospital and it should help a great deal towards the restoration of the patient's self-respect and confidence. As Wootton and Minski point out it is a more profitable investment to maintain these patients in hostels, and to give them a training which will eventually make them self-supporting, than to send them out to face conditions for which they are unfitted and which will probably bring about another breakdown entailing a further long stay in a mental hospital.

1. Wootton, L. H. and Minski, L. *J. ment. Sci.* 1940, **86**, 60.

EXPERIMENTAL DISSEMINATED ENCEPHALITIS

FIVE years ago Rivers and Schwentker [1] produced a disseminated encephalomyelitis in monkeys by the repeated intramuscular injection of heterologous brain material. The resemblance claimed between this experimental encephalitis and the postexanthematous encephalitis of human subjects was supported by the distribution of the lesions and the focal perivascular demyelination. On the other hand the heavy infiltration of these areas with hæmatogenous cells and with conspicuous giant cells constituted a difference. From the histological standpoint a more convincing claim is now made by Ferraro and Jervis,[2] who, repeating the technique of Rivers and Schwentker, have again produced an encephalitis in seven monkeys. The animals received about two injections a week for periods ranging from 112 to 405 days. Clinical signs of the disease did not appear until after 100 days; the monkeys then show forced position of the head, ataxia, coarse tremors, nystagmus, ptosis of the eyelids and spastic paresis. In all of them circumscribed disseminated perivascular lesions were found in the brain, the central white matter being usually affected. Demyelination and aggregation of fat-granule cells were the commonest features in the foci. More rarely the perivascular spaces contained hæmatogenous cells. Multinucleate giant cells were a striking feature in some of the more intensely inflamed areas; sometimes they appeared to be conglomerate foam-cells and sometimes they were thought to be of macroglial origin. An interesting link with disseminated sclerosis was the occasional finding of lesions in which macroglial proliferation had resulted in a tangle of closely interwoven glial fibrils. On the whole there is undoubtedly a close resemblance between this experimental encephalitis and the postvaccinal and exanthematic type of manifestation. When it is recalled that a similar encephalitis has also been recorded as a complication of antirabic treatment, in which again injections of heterologous brain material are given, it will be seen that the theory which holds a neurotoxin to be responsible cannot lightly be dismissed. According to this the lesions result from an antigen-antibody reaction. Specific antibodies have indeed been demonstrated in rabbits by Schwentker and Rivers either by complement-fixation tests or by precipitin reactions after repeated injections of heterologous brain material and they have also shown that homologous brain may display antigenic properties when altered by autolysis or infected by vaccine virus. It thus becomes possible to trace the steps by which this peculiar encephalopathy develops as a sequel to the invasion of the central nervous system by a virus. It is not however clear why if this is the mechanism the incidence of the disease is not considerably greater, or why foci of perivascular demyelination are not a characteristic feature of virus diseases of the brain as a whole.

1. Rivers, T. M. and Schwentker, F. F. *J. exper. med.* 1935, **61**, 689.
2. Ferraro, A. and Jervis, G. A. *Arch. Neurol. Psychiat.* 1940, **43**, 195.

UNIVERSITY OF OXFORD.—An election to the Philip Walker studentship in pathology will be held during Trinity term. It is tenable for three years and the stipend will be between £300 and £350 per annum. The student will be expected to devote his full time to pathological research but he may be permitted to hold a departmental demonstratorship in the Sir William Dunn school of pathology. The studentship is open to both sexes and candidates need not be qualified medical practitioners. Further particulars may be had from the registrar, University Registry, Oxford, to whom applications should be sent not later than June 1.

PREVENTION AND TREATMENT OF WOUND INFECTION

II.—BIOLOGICAL ASPECT OF INFECTED WOUNDS

By L. E. H. Whitby, C.V.O., M.C., M.D. Camb., F.R.C.P.
COLONEL (LATE R.A.M.C.) ARMY BLOOD-TRANSFUSION SERVICE

In wounds under war conditions healing by first intention can never be anticipated unless measures are taken to render the wound in a fit state for such healing, for this ideal method of repair only takes place in clean wounds. In looking at the subject of wound repair from the biological aspect it is worth while to review briefly the fundamental pathology of ideal healing and the factors which prohibit it. By so doing, an opinion can be formed as to what steps should be taken to convert non-ideal conditions into ideal, and in particular to prevent the disasters and dangers associated with implanted infections, especially the tendency to spread locally as well as to penetrate into the blood-stream.

The conditions required for healing by first intention are apposition of the cleanly divided tissues with efficient nutrition of the part—a good blood-supply is the fundamental requirement. A wound then heals with the minimum of reaction and with the least demand for new cell formation because only the cells on the immediate line of the divided tissue are killed. When the wound is made the blood that escapes into it forms a fibrin framework cementing the surfaces together; blood-vessels, accompanied by fibroblasts, grow out from the tissues on either side to vascularise the framework; epithelium grows in from the sides to cover the surface; and finally a scar is formed by contraction of the fibrous tissue.

A number of factors, singly or in combination, may interfere with this simple process, the most important being the impossibility of bringing the divided tissues into apposition, defective nutrition and infection. The process of healing by second intention is essentially the same as by first intention, but the task is far more formidable, takes much more time and is beset with dangers. A good blood-supply is again the fundamental requirement. When there is nothing more serious than mere lack of apposition, simple healing by second intention takes place. A vascularised, fibrinous and later a fibroblastic framework is gradually formed from the bottom of the wound upwards to the surface until the tissue gap is filled and epithelium can grow in from the side. This is the familiar highly vascular granulation tissue; it is the local protective barrier which walls off the exposed and injured tissue from the rest of the body. Were it not for the activity of the phagocytic cells present in such tissue and in the blood, combined with the natural bactericidal action of the blood and tissue fluids, everyone suffering an open wound would quickly die from infection. Granulation tissue has ample power to deal with small numbers of bacteria unless they are highly invasive.

When the wound is extensive, deep, contused, torn or lacerated there must necessarily be considerable interference with the blood-supply to much of the injured tissue. This part then becomes devitalised and cannot recover, nor can it be incorporated in the healing tissue; it becomes necrotic, constitutes a foreign body, invites infection, and holds up healing until digestion and liquefaction by ferments and phagocytic activity have removed it from the sphere of healing. Blood-clot and foreign bodies have the same effect.

THE MECHANISM OF INFECTION

If a wound is infected, either at the time of wounding or afterwards, the whole process of healing is complicated by the occurrence of inflammation. The reaction of inflammation in the acute phase consists in the outpouring of lymph, leucocytes and blood-cells into the infected area with the formation of pus, all with a view to localising and eventually eliminating the infection, cleansing the area, and restoring it to a condition in which it is ready for repair by simple second intention. The whole mechanism is designed to soak the infected site with fluid and cells that are rich in neutralising and bactericidal substances as well as digestive ferments, all of which tend to destroy the bacteria and liquefy necrotic tissue and debris. An important systemic part of the reaction of inflammation is fever, which again is protective; unless dangerously high the fever should not be interfered with, and then only by sponging, never with antipyretic drugs. Some repair, which is also protective—the formation of granulation tissue—goes on at the same time as the reaction of inflammation, but the repair is irregular and in most cases only small in amount. It is not until the infection is removed that the full effort of repair can come into action. Inflammation from bacterial infection favours thrombosis, and this, by reducing the blood-supply and increasing the amount of blood-clot, encourages the spread of infection and hinders healing. When an acute inflammatory reaction fails to overcome an infection and the condition becomes chronic, the œdema, vascular congestion and other obvious signs of inflammation tend to subside, but the tissue will not heal permanently until everything is clean. Whenever there is a residue of infection or a relic of necrotic tissue, the wound will always break down.

Once the protective skin has been injured any organism may be found in a wound. When deeper structures such as the gut are penetrated infection from the natural flora of these structures is an additional complication, while injury to a hollow viscus such as the bladder may encourage infection by reason of the dissemination of an irritating fluid. Under war conditions, the commonest aerobes (and these are also facultative anaerobes) are the pyogenic cocci, of which the β hæmolytic streptococci and *Staphylococcus aureus* are the most invasive. War wounds, especially when they are contracted in countries where the soil is damp and highly cultivated, are notorious for the frequency with which anaerobic bacterial infections become implanted in them. In the torrid sands of Africa, India or Egypt spreading infection is rare because the soil does not readily support bacteria, especially anaerobes. The very nature of a war wound, by reason of the tissues which it opens up as well as the substances which, apart from bacteria themselves, it may implant, gives every opportunity for an infection to flourish. The opening up of muscle tissue presents a bacteriological medium rich in carbohydrates which is extremely favourable to the saccharolytic gas-forming anaerobes; laceration of tissue with consequent devitalisation and necrosis provides a pabulum eminently suitable for all anaerobes. Foreign bodies in the wound may themselves be heavily infected. Thus, bits of clothing have a considerable flora, while soil itself not only may be rich in bacteria and spores but also has the power of activating spores. Experimentally the inoculation

of spores of the gas-forming anaerobes into animals usually has no effect, but if a small amount of sterile soil is included in the inoculum active infection rapidly takes place. Calcium salts are also extremely potent in activating infection and most soils contain such salts.

RESISTANCE AND THE SPREAD OF INFECTION

Whether an implanted infection remains local, spreads extensively or enters the blood-stream to cause septicæmia depends on many factors. There is, in the first place, the nature and the amount of the tissue wounded, for some tissues have more power of localising an infection than others. The resisting power of the peritoneum is common knowledge, as is the ability of this tissue to wall off and localise an infection; in effecting this, the mobile and vascular omentum is an invaluable ally. The strength of the peritoneum lies in the rapid reaction of inflammation which the tissue is able to exhibit. Normally it does not appear to be highly vascular, but it possesses a tremendous potential capacity for rapid vasodilation and for exudation of protective antibacterial cells and fluid. Every surgeon knows that a mere stitching together of the parietal peritoneum will prevent most infections spreading from the abdominal parietes into the abdomen. Muscle tissue, in striking contrast, is highly vulnerable. A very slight injury will interfere with the vital blood-supply to a single muscle segment, while muscle itself is an excellent bacterial medium and infection rapidly spreads along a muscle sheath. Muscle tissue damaged by gas-forming anaerobes is rarely capable of recovery. The longer a local bacterial implant can be kept from multiplying or from invading the blood-stream the greater is the body's opportunity for exerting its protective reaction and successfully resisting the infection. It is in accomplishing this retardation of infection that much is hoped from the wise prophylactic use of drugs with bacteriostatic action—namely, the sulphonamide group.

Of other factors which influence the localisation or dissemination of an infection, there is the invasive power of the organism implanted as well as the amount of the implant; there is the amount of clothing, soil and other foreign matter which finds its way into the wound; and there is the general resistance of the subject, which may be greatly influenced by the rigours to which he has been subjected and the time that has elapsed before his wound can be treated. Thus the element of luck figures largely in determining whether extensive spread of the infection or septicæmia develop. Against coccal septicæmia the immediate protection is the reaction of inflammation; the late protection is the formation of granulation tissue. This protection is less efficient against the anaerobes. Once implanted, the gas-forming anaerobes tend to spread rapidly and blood-stream invasion is as great if not a greater danger in the late phases than in the early. A man who is in poor general condition is not only a "bad surgical risk" from the operative aspect but is also incapable of a good reaction of inflammation, and this is the key to his successful recovery if infection cannot be eliminated or avoided.

Large numbers of those who suffer war injuries arrive at the first point where adequate surgery can be applied in no fit state for either immediate or early operation because of the condition commonly referred to as shock. Shock is caused primarily by injury to body tissues and the most striking and serious clinical feature of the condition is circulatory failure manifested by a fall in blood-pressure, which is progressive unless arrested by treatment. The physiological mechanisms involved in the production of shock are not clearly understood but it is known that a number of factors, singly or in combination, may produce it or contribute to its production. Of these the most important are: loss of blood, extensive tissue injury, not necessarily with loss of blood, burns, pain, cold, fatigue, exhaustion, shortage of food and drink and rapid onset of infection, especially gas gangrene.

The necessity for dealing with obvious bodily deficiencies at the very first opportunity must be appreciated by all who have to deal with wounded men. Resuscitation of the patient is an essential preliminary to surgical procedures. Quiet, rest, relief of pain, application of warmth, the administration of fluids by mouth, per rectum or intravenously; all have their place in such treatment. It is generally agreed that the most serious symptoms of shock are due to a reduction in the amount of *effective* circulating fluid. To combat this, blood-transfusion is of proved efficiency and is especially valuable when there has been severe hæmorrhage. But evidence is accumulating that either plasma or serum may be as effective, if not more so, in cases where the reduction in blood-volume is due not simply to hæmorrhage but to the passage of plasma from the circulation into the injured tissues.

CONCLUSIONS

Except in violent and fulminating infections, there is ordinarily a lag period of five to twelve hours between the time of wounding and the time when the implanted infection assumes a dominating and often uncontrollable position; this lag can doubtless be increased by prophylactic chemotherapy. Lucky is the man who has his wounds attended early. The lag period gives the surgeon opportunity for action. Having first of all resuscitated the patient from the general aspect, he will bear in mind that the fundamental requirement both for healing and for protection against infection is a good blood-supply, and that lacerated, devitalised tissue, blood-clot and foreign bodies encourage both aerobic and anaerobic infection. Clearly all tissue likely to become necrotic should be removed at the earliest opportunity and it is safer to do this drastically at the first operation than later when protective granulation tissue has been formed. Interference with granulation tissue is always fraught with danger, and may readily let loose virulent and invasive bacteria into the circulation. Once the surgical clearing of the wounded tissue has been successfully completed, immobilisation of the part is obviously required, for it both encourages healing and discourages the spread of infection.

When a wound has become infected in spite of all possible precautions, judicious surgery needs to be supplemented by a number of general measures. Every effort should be made to cut any vicious circle which tends to lower general resistance. Good food, adequate fluids, nursing in the open air when practicable are all required, as well as the judicious use of transfusion of fresh blood if long-continued toxæmia is making the patient anæmic. When the infecting organism is appropriate, and it usually is, chemotherapy properly applied is a valuable adjuvant provided the surgeon realises how ineffective are the sulphonamide drugs when pus is present and is not draining freely. As to local applications, care should be taken that the antiseptics, or irrigating fluids if such are employed, are more injurious to bacteria than to the tissues themselves and especially to the cells involved in the reaction of inflammation. For this reason there is much to be said for the reasonable employment as irrigating fluids of so-called "lymphagogues" which encourage the exudation of natural lymph and

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SPECIAL ARTICLES

MEDICINE AND THE LAW

Unqualified Treatment of Disseminated Sclerosis

A Devon coroner expressed surprise last week that any inexperienced person, totally unable to diagnose disease, should be allowed by law to practise as an electrical masseur and to administer infra-red and ultraviolet ray treatment. The deceased, Miss Winifred Snell, had suffered from disseminated sclerosis for some 16 years. She had been attended by a qualified practitioner who, according to her mother's evidence, had been unable to do much for her and who was called in only when the patient's health was specially bad. Through attending a "prayer circle" last year, the mother was advised to take her daughter to Mr. George William Carter of Mutley, an electrical masseur. After a second visit to Mr. Carter, who had switched on various lamps and had massaged the patient's back with certain oils, the skin of the back was found to have been stripped off across the loins. The qualified doctor was summoned and found her suffering from two large gangrenous areas due to burning.

In his evidence at the inquest the doctor attributed the burns to the treatment with light rays on two successive days. He explained that it was one of the symptoms of the patient's disease that the skin became insensitive to heat; while the lamp treatment was proceeding she would have felt no discomfort. In answer to the coroner he expressed the opinion that the lamp treatment was useless and harmful. Mr. Carter stated that no diplomas or degrees were necessary for the treatment which he gave. He had begun to practise electrical massage after being master of a merchant ship. He had practised in Australia and had charge of an institute in Tasmania. He was told by Miss Snell's mother that the patient had suffered from shock some years before. He did not know what she was suffering from, but he thought a course of electrical massage would prove beneficial. He did not think his treatment could burn people without their being aware of it. There would be blisters. He had treated over 1000 people and had never had a burn; he had been 12 years in practice and there had never been any complaint. The coroner found that death was due to disseminated sclerosis, toxæmia resulting from prolonged sepsis possibly caused by burning following treatment by infra-red lamp and ultraviolet rays. He was obliged to conclude that Mr. Carter's treatment started the physical condition which accelerated the death. He could not entirely exonerate Mr. Carter. The coroner suggested that perhaps the legislature would in time require some diploma or other qualification before allowing electrical treatment to be given by persons incapable of diagnosing disease.

No mention, apparently, was made of the fact that in London and other large towns restrictions are imposed by local act on electrical establishments. A system of registration and licensing ensures a wholesome check. Parliament would evidently be justified in extending these local provisions to the whole country. One must have sympathy with parents who naturally try any remedy in a case described as incurable; but it is no kindness to encourage false hopes and the waste of money on such treatment as a so-called electrical masseur does not hesitate to offer for conditions of which he is unaware.

Continued from preceding page

other protective body fluids. But even lymphogogues have the disadvantage of tending to cause local œdema if they are used continuously over a long period.

In dealing with infection, the surgeon is the handmaiden not the master of nature. His task must be to coöperate with nature and direct his actions so as to imitate nature's own methods of protection.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE CARE OF CHILDREN

In his Honyman Gillespie lecture in Edinburgh last week on the care of children during war-time and afterwards Dr. Lewis Thatcher commented on the improvement that has taken place in the national dietary since the beginning of the century and the consequent improvement in the health of the population, but he recalled that there is still much ill health due essentially to faulty dietary habits. The "Drink More Milk" campaign has been fairly successful in stimulating the consumption of this valuable food and in improving the physique of the children. The main deficiency nowadays in the diet of the average person is the lack of wholemeal bread. Bread has been steadily worsening in value during the last 70 years since the introduction of the steel roller mill. Not only has there been virtual removal of the vitamin-B complex but there has also been great reduction in protein and mineral content, while it is likely that all vitamin E is removed in the milling. White bread, he said, possesses no single compensating virtue except the keeping quality of the flour. Any change for the better requires the establishment of a national food policy and an intensive campaign to bring matters before the attention of the public. Under-nutrition is largely due to ignorance although the factors of thriftlessness, carelessness and poverty are undoubtedly significant also.

In considering nutrition in relation to child-bearing Dr. Thatcher urged that provision must be made for the pregnant woman. It is well known that the addition of even a little milk to the diet of children can produce improvement in physique but the addition of milk to the diet of the mother before her child is born has an important effect on neonatal mortality and on the health of the children who live. Stillbirths are more common now than formerly but the reason for this has not been satisfactorily elucidated. Dr. Thatcher suggested that the use of narcotics and a tendency to hurry labour may be involved. He stressed the importance of breast-feeding in relation to infantile mortality and quoted statistics to show that the institution of artificial feeding undoubtedly carries danger. There is a dangerous feeling abroad that hand-feeding is just as good and mothers are too liable to let their babies slip away from breast-feeding. There is no reason why lactation should fail if women are properly fed and properly advised. Failure in the secretion of breast milk is usually due either to failure to empty the breast, manually if necessary in the case of weakly babies, or to unsatisfactory emotional states. If artificial feeding must be used in the early days of the child's life he recommended modified cow's milk diluted 1 to 5. The concentration should

be increased to 1 to 1 at the end of a week, and by the age of 2–2½ months the child should be able to take undiluted cow's milk. The widespread use of cow's milk for feeding human babies means that everyone should be interested in the production of a safe and clean milk supply. Pasteurisation has been fairly effective so far as city populations are concerned but too often the country child cannot be given pasteurised milk and only raw milk which must be boiled is available. The eradication of tuberculous cattle, already making rapid progress, is more important in the long run than the extension of pasteurisation since it will result in the provision of safe milk for country as well as city children. Dr. Thatcher said that the recent evacuation showed that too many children are still being brought up in homes with an inadequate standard of cleanliness and that too many are inadequately trained in decent personal habits. He pointed out, however, that the experience of the Edinburgh Holiday Fund is more gratifying. The fund sends some 5000 children to the country for a fortnight's holiday every summer and complaints from their hostesses about habits and cleanliness are extremely few.

VENEREAL DISEASE IN GLASGOW

The directors of the Glasgow Lock Hospital, which was founded in 1805, have reached the conclusion that the usefulness of the hospital is coming to an end and it will probably be closed in the near future, at least so far as the treatment of disease is concerned. It will, however, continue to be used for research, propaganda work and for prevention. This decision has been reached as the result of the great fall in the number of inpatients and the consequent diminution in the funds derived from Government and local-authority grants. Between 1932 and 1937 there was a 24 per cent. fall in inpatients; in 1938 there was a further fall of 28 per cent.; and last year the fall was 18 per cent. At the moment there are only 9 patients in the hospital. A regularly recurring deficit has been experienced during the past four years. It is pointed out that the drop in the number of patients has been no greater than that experienced by the corporation clinics.

SURGEON'S APPOINTMENT TERMINATED ON MARRIAGE

There has been a good deal of discussion in Glasgow medical circles about the decision of the governors of the Royal Samaritan Hospital for Women not to renew the appointment of Dr. Ellen Douglas Morton as visiting surgeon to the hospital. At the annual meeting it was announced that Dr. Morton had been unanimously elected consulting surgeon in appreciation of her services. Dr. Morton recently married Dr. John Hewitt, one of her colleagues on the visiting staff of the hospital. A representative of the governors has explained that the board has never put any bar on the appointment of women, or even married women, to the medical staff, but on this occasion, which is the first of its kind, they considered that it was not in the interests of the hospital that a husband and wife should hold two out of three senior posts as visiting surgeons. The decision, it was explained, was purely one of policy and not in any way personal.

GLASGOW CANCER HOSPITAL

It was announced at the annual meeting that the results of treatment at the Glasgow Royal Cancer Hospital during the last ten years are now being analysed. Since the war began the work of the hospital has been somewhat curtailed particularly in regard to the radium department. Last year the total number of patients referred to this department was 116 of whom 85 were treated before September, The hospital's own supply of radium, 1359 mg., partly on loan to other institutions, has been recalled, and in view of the danger of its dispersal during an air-raid a bomb-proof bore-hole of special design has been constructed in which the radium can be stored in safety immediately an alarm is given. The cost of the precautions for the safety of the radium has had to be met by the hospital although some feel that this should have been a Government charge. Apart from the radium department, the services of the hospital have been maintained almost undiminished, in spite of the depletion of the staff resulting from the calls of the fighting services.

SWEDEN

(FROM AN OCCASIONAL CORRESPONDENT)

CHILDREN IN HOSPITAL

Professor Gyllenswärd of Stockholm has studied the change in clientele at children's hospitals during the last few decades. In only ten years, the claims on hospital beds for children in Stockholm have risen by about 50 per cent. although in the same period there has been a fall in the number of children in the city. The children in hospital are also much younger. Today most children in hospital in Stockholm are under the age of three years. Conscious of the wonderful opportunities offered by this malleable material, Professor Gyllenswärd is evolving a new and more human type of children's nurse and social worker. There is, for example, a games nurse who finds occupation for the sick child appropriate to his special needs, and who smooths the path of the problem child.

A CROSS SECTION OF GENERAL PRACTICE

A painstaking and information-seeking Swedish doctor has analysed 1000 consecutive cases seen in the course of eight months in a typical general practice. In 130 cases the patient had to be sent to hospital or to a specialist; as many as 200 cases concerned colds in the head, sore throat and the like; 50 cases were recognised as neuroses, and 10 as psychoses; and 160 cases came under the general heading of nervous disturbances. The impression gained by this study is that the most formidable task the general practitioner has to face is to distinguish between the banal and the urgently important.

TUBERCULOSIS AMONG SWEDISH DOCTORS

In *Svenska Läkartidningen* for March 8, Dr. Gunnar Biörck has published a study of Swedish doctors examined for army medical service. In October, 1939, a census was taken of the doctors available for service in war. A card-index system provided for three main groups. It was found that 71 per cent. were fit for military service; 11 per cent. were women; and 18 per cent. were men exempt from military service. The most important reason for exemption was tuberculosis, which was responsible for 43·5 per cent. of the exemptions for doctors, and 24 per cent. of the exemptions for medical students. In other words, 8·9 per cent. of all the male doctors were exempt from military service on account of tuberculosis.

A TIME-SAVING DEVICE

The Swedish Society of Apothecaries has lifted up its voice in more or less genuine lamentation over a custom whose origin can be traced back to a chemist

imbued with the traditions of dog Latin. The trouble began when a doctor wished to save his patient the cost of a well-known proprietary remedy. The doctor would like, had he the necessary time and knowledge, to write out the chemical constituents of the remedy. But boggling at the task of prescribing ethylmorphini hydrochloridi he took his pen and wrote down quickly: "Dionin loco." This short cut has now become so popular as to be almost general. No ordinarily intelligent chemist could miss the point, or what the doctor meant to be the point of his prescription. But is not the very clarity a mistake? For if anything has for centuries preserved the sanctity and omnipotence of medical prescriptions, it must have been their illegibility.

PARIS

(FROM AN OCCASIONAL CORRESPONDENT)

PARIS AS AN INTERNATIONAL MEDICAL CENTRE

EARLY this year, without any splash of publicity, the annual meeting of the A.D.R.M. (Association pour le développement des relations médicales) was held at the Faculty of Medicine. This body was founded by Professor Hartmann, the surgeon, who continues to be its mainspring. Professor Achard, prevented by an attack of influenza from presiding at this meeting, sent his greetings and an address which was delivered by one of his colleagues. In this he stressed the importance of travelling and international medical conferences as means to the development of better relations between doctors in different parts of the world. Professor Achard himself has recently visited Japan. Professor Hartmann gave an account of the visits to Paris of distinguished medical foreigners, and of visits paid abroad by French members of the profession. Appreciative references were made to the work of the secretary of this association, Mademoiselle Huré, who has endeared herself to many foreign visitors by acting as their guide, philosopher and friend.

CERTIFICATS DE COMPLAISANCE

A "certificat de complaisance" is the document you sign with a more or less uneasy conscience when you state, without being quite sure, that so-and-so is seriously ill and urgently in need of the presence of some relation serving with the forces. Correspondence in the medical press over this conflict in loyalties shows how difficult it is to play fair and yet not alienate the goodwill of influential people. There are several ways in which the difficulty may be met. You may get someone else in an official position to countersign your certificate and thus share responsibility with you, or if you smell a rat you may point out to the person asking for such a certificate that, in the event of a prosecution, he or she as well as you may get into trouble. Article 160 of the penal code now runs as follows: "Every doctor, surgeon or other medical officer who, to show some one a favour, certifies falsely the existence of diseases qualifying for dispensation from some public service or in order to obtain a pension or grant from the state or some public body is to be detained in prison for at least one year and at most three years." The prosecution must, however, show that a doctor has acted in bad faith; he is exonerated, however mistaken his diagnosis, if he has acted in good faith. Considering how nebulous the quality of faith may be it evidently behoves every doctor to be quite sure of his diagnosis before he puts pen to paper, never committing himself to a hear-say diagnosis emanating from some person whose yearning for an absent relative at the front conjures up morbid visions apt to be dispelled in the dispassionate atmosphere of a military tribunal.

MUFTI FOR ARMY DOCTORS ON LEAVE

An army order dated Jan. 10 assures a much appreciated relaxation of the regulations concerning the wearing of uniform when on leave. Officers and soldiers on leave may now don mufti and attend to certain civilian duties of a remunerative character provided uniform is still worn when travelling and when dealing with certain authorities. This concession is particularly welcome to medical men, not least because of the distinction drawn by the public between uniform and mufti in the matter of fees. In uniform you are obviously the servant of the state, and the public shrink from hurting your feelings by asking you what your fee is. Mufti, on the other hand, suggests that you are dependent for a living on remuneration for your services.

IRELAND

(FROM OUR OWN CORRESPONDENT)

HOSPITALS TRUST FUND

IN the Dáil last week the Parliamentary Secretary to the Minister for Local Government and Public Health stated that there was at present £8,500,000 in the Sweepstake Fund. He added that £3,500,000 would be required for the endowment of voluntary hospitals, and this amount would have to be increased if the upward trend of the deficits of the voluntary hospitals was not checked. About £1,000,000, he said, was required for the completion of works in progress, including voluntary hospitals. The balance was earmarked for new voluntary hospitals in Dublin and for the provision of institutions in counties where the need was most urgent.

HONOUR FOR DR. DENIS COFFEY

The Pope has conferred on Dr. Denis Coffey, president of University College, Dublin, the Grand Cross of the Equestrian Order of St. Sylvester, at the same time expressing his high appreciation of Dr. Coffey's work in promoting education, of his long and distinguished career, and of his personal character.

ST. LAURENCE O'TOOLE HOSPITAL

The board of governors of this new hospital, which has been named after Dublin's first archbishop, is, according to a bill published last week, to be set up by the Minister for Local Government and Public Health. The board is to prepare and submit to the minister a scheme for the erection of the new hospital, which the minister will have power to accept, modify or reject. The board's powers of appointing staff and fixing rates of pay are also subject to the minister's consent. The extensive powers to be granted to the minister seem to cut deep into the powers of the board. But there is a proverb which says that "Who pays the piper calls the tune," and as the minister has the power of making the necessary disbursements from the Hospitals Trust Fund his power is supreme.

BOARD OF TRADE.—The following articles will continue to be exempt from key-industry duty until June 30 :—

Barbitone (Veronal; Malonal; Malonurea; diethylbarbituric acid; diethylmalonylurea; Hypnogen; Debs).
Glycol ethers.

ECONOMY IN PRESCRIBING

Official Recommendations

THE Therapeutic Requirements Subcommittee of the Medical Research Council has prepared the following statement on the need for economy in certain ingredients of medicines. The recommendations have been agreed by the Ministry of Food and are now issued by the Ministry of Health for the consideration of all medical practitioners and pharmacists.

SUGAR

The situation in relation to supplies of sugar was recently reviewed by the Minister of Food, who gave reasons for the control of this commodity and for restrictions on the amount to be used. The present position requires that the supplies of sugar should be directed into the forms in which they are most useful as foods. The quantities of sugar used annually in preparing medicines are considerable and a definite restriction in this way would be helpful to the country. The Ministry of Food has allowed, for the time being, a full ration of sugar for medicinal purposes but has made the concession on the understanding that economies will be made voluntarily by the medical and pharmaceutical professions. Otherwise rationing will have to be introduced. This being the case, members of the medical profession are urgently requested to restrict their prescriptions, for preparations containing sugar, to those cases in which such preparations are essential.

A survey of official preparations and standard prescriptions shows that the prescribing of preparations containing sugar could be restricted almost entirely to medicines for children without any serious loss of therapeutic efficiency. An appeal is made to the medical profession generally to bear the difficulties of the situation in mind when writing their prescriptions. It is to be hoped that by voluntary effort in this way the quantity of sugar used in making medicines may be reduced, so that it will be possible to maintain the present formulæ for pharmaceutical preparations. The alternative is rationing of pharmaceutical manufacturers with the consequent necessity for altering the formulæ of the British Pharmacopœia and the British Pharmaceutical Codex by removing sugar and substituting some other sweetening agent. The alteration of official formulæ is undesirable. Syrups which are used merely for flavouring purposes —orange, lemon, ginger, and possibly tolu—might well be omitted from prescriptions. Certain tonic syrups such as Easton's, compound glycerophosphates and compound hypophosphites, could be prescribed in the form of the equivalent tablets, which are readily available.

CITRATES

Citric acid is now manufactured chiefly from sucrose by a biological method and the necessity for the conservation of stocks of sugar has given rise to difficulty in regard to supplies of citric acid and citrates. Prescribers would be wise to restrict their use of citric acid and citrates to cases in which they are essential.

COD-LIVER OIL

While it is understood that sufficient cod-liver oil is at present available to meet all reasonable medical requirements, it cannot be stated with certainty that this position will be maintained, and in order to conserve supplies it is clearly desirable that the strictest economy should be observed in its prescription and administration. The maximum effective daily dose of vitamins A and D is contained in about three teaspoonsful of the oil and no useful therapeutic purpose will be served by exceeding that dose. In most cases it is found more satisfactory and economical to administer the oil without admixture rather than in the form of an emulsion or in combination with malt extract.

Cod-liver oil provides a convenient way of administering vitamins A and D, but any edible oil containing the necessary vitamins would be satisfactory as a source of these vitamins if it were required to conform to a recognised specification. In this connexion it is understood that the British Pharmacopœia Commission have in course of preparation, and purpose shortly to make official, a specification for a vitaminised oil containing vitamins A and D in a suitable edible oil.

STARCH AND FATS

Starch, animal fats, and vegetable oils and fats are controlled by various orders and departments of the Ministry of Food, but special privileges have been extended to the medical and pharmaceutical professions to allow of the use of these substances for therapeutic purposes. Efforts will be made to ensure that sufficient pure leaf lard will be available for all legitimate medical purposes but it is desirable that substitutes should be used wherever possible. Moreover, whereas early orders prohibited the use of vegetable oils and fats for any purpose except food, permission has now been given to allow the use of any of the following oils for the purpose of the preparation of any medicine or medicament for internal and external use—coconut oil, cotton-seed oil, gingelly (sesame) oil, ground-nut (arachis) oil, linseed oil, maize oil, olive oil, palm oil and soya-bean oil. Liquid paraffin, soft paraffin both white and yellow, and hard paraffin or paraffin wax are governed by the various rules and orders issued by the Petroleum Board, but for the present sufficient supplies are available for medical purposes. The medical and pharmaceutical professions, having been spared the burdensome procedures associated with rationing, should exercise every economy in all the articles referred to in this paragraph. There are few large hospitals and dispensaries, for example, in which it would not be possible to reduce greatly the consumption of liquid paraffin, without detriment to the patients.

Hints for Prescribers

Doctors will not find it easy to apply these recommendations to their practice, and more detailed suggestions may be helpful. The need for economy in imported drugs has also to be borne in mind, and here the prescriber will need specific information, some of which is set out below.

Sugar is largely prescribed as an ingredient of medicinal syrups, and reducing the concentration of sugar in these would render them liable to fermentation. Syrups should, however, be mainly reserved for children's medicines. The adult tonic syrups, Easton's and Syrup of Hypophosphites, may be replaced by Tab. Eastonii B.P.C. and Tab. Hypophosphitum Co. B.P.C. If a sweetening agent is essential use Elixir of Saccharin B.P.C., dose 5–20 minims. This preparation is not as popular as it deserves to be. It may be used along with the tinctures of orange or lemon if required. Five minims of Tincture of Orange and five minims of Elixir of Saccharin is a satisfactory substitute for one drachm of Syrup of Orange. Note, however, that the tinctures of orange and lemon are expensive owing to the full alcohol duty on both. Do not substitute glycerin for syrup because glycerin is wanted for other purposes. The

prescribing of potassium chlorate in tablets instead of Troch. Pot. Chlorat. also leads to a saving in sugar. The important motto is: Think before prescribing any syrup.

Extract of Malt is of doubtful therapeutic value. Barley is used in its manufacture and supplies of barley must be conserved for more important purposes. Palatable emulsions of cod-liver oil may be used if there are objections to the administration of the pure oil.

Alcohol is an essential ingredient of all tinctures. Liquid extracts are efficient substitutes for some of these and besides saving alcohol are very much cheaper.

minim	ext. bellad. liq.	is equivalent to	25 minims	tinct. bellad.
1 ,,	ext. hyoscy. liq.		10 ,,	tinct. hyoscy.
1 ,,	ext. ipecac. liq.		20 ,,	tinct. ipecac.
1 ,,	ext. nucis vom. liq.		12 ,,	tinct. nuc. vom.

The prescribing of standardised powders is even better. These will save in cost, storage space and containers, and in alcohol. In addition, Digitalis Pulverata and Ergota Præparata are the most stable and effective preparations of these two drugs.

1 grain	bellad. pulv.	is equivalent to	10 minims tinct. bellad.
1 ,,	digit. pulv.		10 ,, tinct. digit.
1 ,,	ergota pulv.		2 ,, ext. ergotæ liq.
1 ,,	nux vom. pulv.		10 ,, tinct. nuc. vom.
1 ,,	ipecac. pulv.		20 ,, tinct. ipecac.

Concentrated medicinal waters are alcoholic solutions of volatile oils. They are expensive and in most cases no spirit rebate is obtainable on them. One or two minims per ounce of the corresponding volatile oils makes a satisfactory substitute.

Mercurials.—The price of mercury has increased enormously since the outbreak of war. Few mercurials are essential. Mercuric chloride is dangerous to handle and can usually be replaced by some of the modern powerful phenolic disinfectants.

Liver extracts.—Use the parenteral preparations wherever possible; they are cheaper and less raw liver is required with them to supply an effective dosage. Liver preparations should not be used as general tonics or for the treatment of secondary anæmias.

The sulphonamides.—Sulphapyridine is much more expensive than sulphanilamide. It seems that the additional outlay is justified in the treatment of pneumococcal and gonococcal infections but not in streptococcal infections. There has been a tendency to substitute sulphapyridine for sulphanilamide in all cases. Do not give sulphonamide preparations by injection without good reason, for treatment by mouth is cheaper.

IMPORTED DRUGS

In prescribing proprietary drugs, consider the country of origin. Does their use entail the outlay of foreign currency? Are they essential? Or is there an equivalent preparation in the B.P. or B.P.C.? Over and above these the following widely used drugs come from abroad and should be prescribed with care.

Borax and boric acid, caffeine, theobromine, theophylline, emetine, ephedrine, mercurials, ergot, ipecacuanha, menthol, natural camphor, balsams of Peru and tolu, benzoin, belladonna, cinchona, gentian, liquorice, castor oil, turpentine, rhubarb, hyoscine.

Purgatives and laxatives.—These tend to be prescribed indiscriminately. The following require foreign currency for their purchase: cascara sagrada, liquid paraffin, olive oil, jalap, scammony. Most of the saline purges—e.g., magnesium sulphate and sodium sulphate—and aloes and phenolphthalein do not. Supplies of liquid paraffin are somewhat restricted and the price has advanced considerably. The large quantities handed to outpatients at many hospitals could certainly be reduced.

Bismuth salts.—Bismuth carbonate is used in enormous quantities in alkaline powders and mixtures, but its therapeutic value is doubtful. In the treatment of duodenal ulcer various combinations of calcium carbonate, sodium bicarbonate, kaolin and magnesium oxide have been successfully used in place of the more expensive compound bismuth powders. Bismuth carbonate cannot be regarded as an essential ingredient of every indigestion mixture. The following substitutes are suggested; a and b are modified from the U.C.H. pharmacopœia and c and d from the pharmacopœia of St. Thomas's Hospital.

(*a*) Calc. carbonat.
Mag. carb. Pond.
Sodii bicarb.
Kaolin. Equal parts.

(*b*) Kaolin. 1 part.
Mag. oxid. Pond. 1 part.
Sod. bicarb. 2 parts.

(*b*) Mag. carb. Pond. 8 parts.
Sod. bicarb. 3 parts.
Calc. carb. 12 parts.

(*c*) Kaolin. 3 parts.
Mag. carb. Pond. 6 parts.
Calc. carb. 12 parts.

Edible oils.—Olive oil is expensive and comes from foreign countries. Arachis oil (nut oil) is a colonial product, is cheaper, and is a satisfactory substitute in most preparations.

Bitters.—Quinine has to be bought with foreign currency. It should not be used merely as a bitter tonic. Other bitters are available and large quantities of quinine are needed for the treatment of malaria. Gentian comes from Central Europe, whereas quassia and calumba are colonial products. Therefore use Inf. Quassiæ or Inf. Calumbæ in preference to Inf. Gent. Co.

Hypnotics and analgesics.—The bulk of the barbiturates formerly came from abroad, but this situation is now being rectified. For economy's sake do not use more trade names than you must. Before prescribing soluble barbitone consider whether phenobarbitone will give the required hypnotic effect. Although phenobarbitone is about half as dear again as soluble barbitone, a much smaller dose is needed (from a fifth to a tenth). Aspirin and phenacetin are manufactured here and are relatively cheap. Phenazone and amidopyrin come from abroad, are expensive, and are rarely essential.

The Lancet 100 Years Ago

April 4, 1840, p. 64.

From the Table of Mortality for the Metropolis for the 5 weeks ending March 21, 1840

Causes of death	Feb. 16 to 22	Feb. 23 to 29	March 1 to 7	March 8 to 14	March 15 to 21	Weekly av. 1838 (corrected)
Small-pox	9	4	9	8	13	76
Measles	12,	11	15	19	14	12
Scarlatina	44	45	36	24	47	30
Hooping-cough	22	27	26	17	26	42
Croup	6	11	9	10	8	7
Thrush	6	5	8	2	3	6
Diarrhœa	3	5	3	6	5	8
Dysentery	2	1	—	1	—	2
Cholera	—	—	—	—	—	0·3
Influenza	4	—	1	2	3	1
Typhus	20	21	26	26	29	82
Erysipelas	1	5	5	3	3	8
Syphilis	—	1	1	2	1	1
Hydrophobia	—	—	—	—	—	0·2
TOTAL	129	136	139	120	152	276
Deaths, all causes	855	916	969	908	946	1051

IN ENGLAND NOW

A running commentary from our Peripatetic Correspondents

THE longer one studies the policy of evacuation, the more doubtful one becomes as to its wisdom or folly. But last September at any rate it seemed to be right and inevitable, and if that be admitted the actual carrying out of the enterprise is worthy of admiration. Not perhaps in all its details, for there were obvious precautions, especially on the medical and welfare sides which were overlooked. But as time goes on other aspects of the problem have been forced to the front, especially the almost complete abandonment of the educational and disciplinary value of an elementary-school training. It was an unexpected and terrifying discovery that for a large number of children left in London evacuation meant the cessation of the chief civilising influence in their lives, and their relegation to the life of the streets with no interests, no control other than that of the police, and often with inadequate nutrition. The situation evoked the memory of the child-brigand bands of Moscow in the days of the Russian revolution. Fortunately we have realised the dangers fairly early, but not, I am afraid, soon enough. In the reception areas the results of evacuation are more hopeful. Where the children have been allowed by their parents to settle down there has been on balance a gain both to the children and to their hosts, though the inadequacy of school buildings to accommodate the additional numbers has been a strain on the billeting housewives which can only be appreciated by those who know the relief which the normal school hours afford to the hard-worked mother. In my own area comparatively few of the evacuees have gone home and those who have stayed have settled down to the satisfaction of the parents and of the hostesses—though this does not mean that we contemplate with any enthusiasm a further evacuation and a further strain on hospitality.

Today with all the pros and cons in mind one is compelled to question the wisdom of the original evacuation: whether in fact it would not have been wiser in the long run to have faced the possible deaths of x school-children, rather than disturb the social and above all the educational order. I am inclined to think that evacuation was not merely sentimentally but also politically correct; I cannot agree that the experiment has been, as some would have us believe, a triumphant success.

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The Abbatt exhibition at 94, Wimpole Street was well worth a visit, if only because evacuation is a fact. For better or for worse it has happened, and more will happen. No attempt to make it successful and constructive, rather than merely obligatory, should be taken lightly. The exhibition arose out of a competition, sponsored by the Building Centre in Bond Street, for plans of evacuation centres and holiday camps. The promoters hoped the Government might be interested. I was told that nearly all of the Government projected plans are already finished and up. I hope this is not true, for the point of the exhibition is to give publicity to other plans and to put forward a positive policy for evacuation. These plans are based on alternative use: (a) in peace-time as holiday centres throughout the year, and (b) in war-time by simple adaptation to hold double the number of children. They show three types of centre: (1) for small units of evacuated mothers and young children; (2) for nursery schools en bloc with staff and with some parents; (3) for evacuated children in camp blocks with supervisors—what is virtually a boarding-school for older children. Planned before the war, the buildings are constructed largely of timber. Obviously their design would now have to be modified because of shortage of material, but they could still, it was maintained, be made more cheaply than the orthodox huts. I could believe this having seen something of municipal contracts which made a place cost as much as if it were constructed of mother of pearl. I hope I am wrong, but I did just wonder if the Government could have succeeded in getting them put up at the estimated figure.

The whole exhibition at first struck me as a bit hypothetical—all very well, you know, if there were not a war on. But when I went into it, if what the designers say is true there is no reason why such buildings should not be put up. The camps would then be permanent and lovely buildings, harmonised externally to their surroundings and internally to their function. Anyone working with children knows how work can be made easier or more difficult by the building they are housed in. These plans had obviously in mind both the educational and recreational needs of a group of lively children, and the human limitations of the staff. Bunks take the place of long and crowded dormitories for the older children, leaving enough floor-space for each child to house personal belongings in a recess similar to a cubicle. There is a bed-sitting-room apiece for the staff and a central block for domestic and official use. The children sleep and spend the day in small separate units. The nursery school is in effect a residential nursery school with a similar plan for sleeping the children in small units. Each block has a washing-room planned for economical plumbing, and everywhere narrow and cramped spacing has been avoided. The designs provide for the needs of the individual child, in space and room for his things, as well as for the communal nature of the settlement as a whole—a matter of paramount importance in buildings to be used later as holiday camps.

The exhibition was an eye-opener to me, and I hope they were right about the price. I have no reason to doubt except that their plans were so nice—and nice things are never cheap. The buildings, by the way, are flat-roofed. I am not clear why except that it is modern.

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My husband is a member of the Royal College of Physicians, so is the friend who came here the afternoon I noticed my rash. "Do you think I've got it?" I asked. "You might have," said my husband. "I've only seen one case." His friend examined me. After some time he said, "Menstrual scurf." As they are both psychiatrists I decided to go and look up German measles in the nearest copy of "Price." Outside the village inn we stopped to inspect the rash in a better light. The landlady and her daughters leaning from a window twenty yards away made their diagnosis without hesitation. "She's got it," they said. They were quite right. And don't let anybody underrate German measles as a disease.

• • •

"Treatment with antitoxic serum was also effective in the case of a strain of high toxigenicity, but failed against a strain of low toxigenicity but probably of higher invasiveness." The English language, especially in the hands of scientific workers, is "a fearful and wonderful wildfowl." But this sentence will convince

the most ardent pessimist that it is still very much alive, for such a collocation of neologisms is barely intelligible to men of the last generation, and yet to his contemporaries it expresses succinctly what its author desired to convey. "Aggressiveness," which he could find in a dictionary, would perhaps express in part his thought, but it fails to convey the exact meaning of the behaviour of the organism, so that without more ado he coins the word "invasiveness." It is an interesting example of the growth of language, and sheds a flood of light on the folly of those who inveigh against neologisms which they personally dislike. When a language is alive and kicking it is well to remember the apophthegm of Montaigne: "They that will fight custom with grammar are fools." "The world is ever moving," says Trench, "and language has no choice but to move with it." Yes, I approve of "invasiveness," though there are other scientific terms which hardly carry their warranty with them.

• • •

I lately made a sentimental journey to a certain drill hall where six months ago I was "embodied" as M.O. of a Territorial unit to which I had been attached for several years. Now that I have become a civilian again it is comforting to reflect that, so far, no member of that unit has become a casualty from enemy action. The deserted drill hall, in charge of a decrepit billet-warden, is a melancholy spectacle. The mess is bare and dusty; I remember it full of inwardly tense but outwardly care-free officers smoking and drinking beer or gin-and-lime while waiting for news during those warm days in early September. Over there by the window had stood the small rickety table where the C.R.A. and C.O. had sat with a newspaper map of the war-zone in front of them. The C.R.A. had picked up a ruler, borrowed a pencil and solemnly divided Germany into a dozen segments. "There you are, gentlemen," said he, "that's what's got to be done this time. I shall put one officer in charge of each of these segments. The segment-commander will be personally responsible to me that all the people in his segment have enough work to do, decent facilities for recreation and plenty of good grub. What's more, nobody in the whole place is to be allowed to make or carry a weapon of any kind, not even a walking stick. You'll come with me, doctor, and we'll visit 'em all in turn, staying a month in each segment. And they'll have to entertain us in slap-up style." No more benevolent dictatorship could be imagined.

I wandered down the echoing corridor to the lecture-room in which I had "examined" the troops on embodiment; a fine, eager collection of men mostly young, the rest not so young and perhaps a shade less eager, but all bluffing well. I looked in on the gun park where I had delivered my celebrated flesh-creeping lectures on V.D. Next, I inspected the skeleton of the open-air cookhouse where I had scarified the sergeant-cook (who ought to have known better) for harbouring his spare pair of boots and none too hygienic socks in the meat-safe. Finally I walked across to that small cell in which I had carried out inoculations and seen the sick. I was reminded of that red-headed reservist who looked like a hardened criminal, a tough egg if ever there was one. "You look as if you've never done anything wrong in your life," I said facetiously. He pondered the remark for some time. "I 'ave, sir—lots," he sadly replied. I bethought me also of the superior young man who had reported sick, and when asked what was troubling him had answered: "I appear to have a continual desire to defæcate, Sir"—a statement which had made the sergeant-major feel quite faint. It is odd how these disconnected incidents stick in the memory.

• • •

"What are those three men over there?" asked an old lady in a teashop in Bristol. "Those are three senior medical officers in the R.N.V.R.," said her companion. "Oh dear," said the old lady, "I thought they were B.B.C. bandsmen." So now they call the neuropsychiatric unit Des — and his Psychics.

PUBLIC HEALTH

Paratyphoid on the Clyde

DURING last month there was a rather extensive outbreak of paratyphoid B in Glasgow and at the same time in certain of the adjacent burghs and county areas. Up to March 27 the number of cases in Glasgow itself reached 250 with a further 140 in the burghs of Paisley, Clydebank and Coatbridge and in the counties of Lanark and Renfrew. In Glasgow several cases of continued fever were notified on the 5th, 6th and 7th and on the 7th and 8th a few isolated cases of paratyphoid. These were all closely investigated but nothing suggestive of any connexion between them was apparent, except perhaps in one family grouping. Notifications in the city averaged 14 per day during the week ending March 16.

It was early apparent that the onset of the disease could in a very large proportion of cases be allocated to the first seven days of March, and it seemed probable that the infection had been disseminated during a restricted period from about Feb. 17 onwards. The family grouping already mentioned suggested Feb. 25.

The cases were widely scattered over the city, although when plotted on a map there were certain geographical concentrations. The distribution of the cases, however, bore no relationship to any known distribution of water, milk or other food-supply, and epidemiological investigation has so far failed to locate the source of the infection or the vehicle by which it was spread. The appearance of the disease in other areas where many of the cases had no apparent connexion with Glasgow makes the theory of a common origin difficult to establish. Early in the outbreak the altered distribution of certain common foodstuffs arising out of food control was discussed and investigated. Also there had been extensive interference with domestic water-supply and drainage during the severe frost and the subsequent thaw in February. The genesis of the outbreak can hardly be determined until all these data have been collated. The sickening dates of the Glasgow cases were as follows:—

Week ending March 2 ..	55	Week ending 16 ..	30
,, ,, ,, 9 ..	119	,, ,, 23 ..	7

Early in the epidemic most of the cases set in rather suddenly, usually with vomiting and diarrhœa as the major complaints. The dejecta varied between the typical pea-soup of the enteric group and a green, somewhat offensive stool. A review of 100 cases showed some 50 per cent. mild, 30 moderately severe, and the remaining 20 ran a rather severe course. Hæmorrhage has not been a marked feature. Many showed the characteristic rose spots which in some instances were profuse. Of the three deaths two occurred from perforation in cases diagnosed shortly after admission to hospital.

Points from Annual Reports

A FEATURE of the annual reports of the county borough of *Ipswich* is a series of tables giving the vital statistics of the town, compared with those of England and Wales, since 1841. Naturally a century in the health of a population reveals many curious changes in its records. In 1801 the population of Ipswich was 11,277. This increased without a break to 95,070 in 1938, though the rate of increase varied from 29·6 per cent. in the decade 1841–51 to 7·4 per cent. in the decade 1911–21. The birth-rate from 1841 to 1938 closely followed that for the whole country, but the crude death-rate, except for the first decade of the period, was always below that for the whole county by an average of 1·0 per thousand. The percentage of total deaths in persons over 70 years of age rose from 14·67 in 1841–51 to 46·85 in 1937, but in 1938 it fell again to 45·30. The fall in the death-rate of respiratory disease from 3·39 in 1871–80 to 0·91 in 1938 is the most important factor in the increase of longevity. The death-rate from circulatory disease rose from 1·074 to 3·328 in the same period. A table of great interest is that of infantile mortality in which the sexes are differentiated. Generally the mortality of female infants is 70 per cent. of male, but in 1932 it was 182 per cent. and in 1938 it was 49 per cent. Higher vulnerability of the male is a well-known but unexplained natural phenomenon. It now operates at all ages and for all causes of death, save those peculiar to each sex, and so cannot be explained by environment. A satisfactory feature of the 1938 statistics was the fall of maternal mortality to 1·32, the lowest rate recorded, for in the past maternal mortality has been high in Ipswich. In 1936 it was 5·80 and in the following year 5·02.

Dr. B. Wood-White, county medical officer of *East Suffolk*, introduced in 1926 a method of estimating the economic effect of changes in the causes of death by giving to each age a figure of value and assessing the damage done by any disease as the number of deaths from that particular cause multiplied by the figure of value. This figure is 0 for those over seventy-five years of age, 5 for infants below one year and 25, the highest value, for those between twenty-five and forty-five. In 1938 the four chief causes of death in East Suffolk were: heart disease responsible for 702 deaths; cancer for 400; tuberculosis for 78; and bronchitis for 56. The comparative damage to the community worked out at: cancer 2800; heart disease 2789; tuberculosis 1376; bronchitis 104. So, though heart disease killed nine times as many people as tuberculosis the damage done by it was only twice as great. Dr. Wood-White's figures of value may be open to argument, but the assessment of the damage done by disease is of growing importance to public health, the main business of which is the elimination of what interferes with the value of life. The Americans work their public-health system on "the purchasing power of the public health dollar" and have worked out the "market value" of their citizens so that they can decide the value of measures for the relief and suppression of disease. Dr. Wood-White's figure of value sounds less mercenary than value in dollars, but it comes to the same thing.

East Suffolk is a rural county, its main industries being agriculture, fishing and coastal trade. Its population is almost stationary round about 206,000 and for the last five years its corrected death-rate has been absolutely stationary at 10·3. The vaccination rate for the whole county in 1938 was 39·9 per cent., but it varied greatly in the different districts from 69·9 in Wickham to 8·4 in Lowestoft. Excluding Lowestoft, the rate for the county was 50·6.

Darlington is one of a small group of British towns with stable populations and the nearest we possess to a semi-closed community. In mid 1938 it had 75,930 inhabitants, a rise of 430 since 1936, of which the excess of births over deaths in the two years accounted for 390. This gives to its health reports a value in history absent from those of communities distributed by migration. In 1921 the average size of families was 4·39, in 1931 it had sunk to 3·82, clearly showing the influence of the declining birth-rate. In his report Dr. G. A. Dawson gives two tables of blind people which are highly instructive. The total number of registered blind persons was 92, of whom only 1 was under five years old, 4 under twenty-one years old and exactly half (46) over sixty-five. The ages at which these persons became blind were: 13 under one year old, 21 under twenty-one years old and 31 over sixty. The school ophthalmologist, Dr. A. T. Paterson, draws attention to the smallness of the number of minor eye diseases that had been under observation. He attributes this to the better nourishment provided for necessitous children.

Dr. Stuart F. Allison, of *Warrington*, in his school report records an unusually healthy state of the children routine-inspected, for of 3247 inspected only 229, or 7·05 per cent., were found to require treatment (excluding uncleanliness and dental diseases). Only 3, or 0·09 per cent., were found by the doctor to have verminous heads. This must mean that the doctor's standard was low, or that the children are specially cleansed for the inspection, for the surprise visits of nurses for the detection of uncleanliness found 2496 children with unclean heads, of which 47 were in such a state as to warrant exclusion from school.

Infectious Disease in England and Wales

DURING THE WEEK ENDED MARCH 16, 1940

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 984; whooping-cough, 565; diphtheria, 747; enteric fever, 17; measles (excluding rubella), 4332; pneumonia (primary or influenzal), 1588; puerperal pyrexia, 193; cerebrospinal fever, 543; poliomyelitis, 12; polio-encephalitis, 2; encephalitis lethargica, 4; dysentery, 29; ophthalmia neonatorum, 95. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on March 15 was 1226 made up of: scarlet fever, 120; diphtheria, 179; measles, 3; whooping-cough, 57; enteritis, 52; chicken-pox, 52; erysipelas, 33; mumps, 6; poliomyelitis, 2; dysentery, 7; cerebrospinal fever, 93; puerperal sepsis, 17; enteric fevers, 8; german measles, 379; other diseases (non-infectious), 67; not yet diagnosed, 151.

Deaths.—In 126 great towns, including London, there was no death from smallpox or from enteric fever, 1 (1) from scarlet fever, 4 (0) from measles, 5 (0) from whooping-cough, 22 (1) from diphtheria, 33 (2) from diarrhœa and enteritis under 2 years, and 315 (28) from influenza. The figures in parentheses are those for London itself.

Sheffield reported 21 deaths from influenza, Stoke-on-Trent 11, and Birmingham 10, no other great town reporting more than 8. There were 6 deaths from diarrhœa at Birmingham and 3 each at Wolverhampton and Liverpool. Fatal cases of diphtheria were scattered over 15 great towns, Liverpool reporting 4. There were 15 deaths from cerebrospinal fever in London, and 3 each in Glasgow and Dundee.

To the 543 cases of cerebrospinal fever Berks contributed 12 (Reading 9), Chester 11, Derby 15, Durham 11, Essex 19 (Colchester 6), Gloucester 16 (Bristol 13), Kent 22 (Canterbury 5), Lancaster 45 (Liverpool 15, Manchester 8), county of Leicester 14 (Leicester 8), County of London 51 (Wandsworth and Lambeth each 6, Southwark 5), Somerset 16, Southampton 19 (Bournemouth 5), Stafford 23, Surrey 22 (Frimley and Camberley 5), Warwick 21 (Birmingham 16), Yorks (West Riding) 28 (Leeds 6, Sheffield 9), Glamorgan 33 (Cardiff 10), Monmouth 13.

LETTERS TO THE EDITOR

PEPTIC ULCER IN THE SERVICES

SIR,—While it is of course happily true, as Professor Pannett says, that many patients who have undergone operative treatment for peptic ulcer suffer no apparent subsequent handicap, it is certainly not true of a very considerable proportion. Probably any long-distance follow-up of any large industrial group of workers, under accurate sick-record conditions, would make this clear. In such a follow-up, reported by Dr. W. L. Scott and myself in your columns (*Lancet*, 1935, **2**, 710) of a group of cases observed for not less than 3 and up to 20 years, the following facts emerged.

Of 200 manual and non-manual workers who had been operated upon for duodenal ulcer 33 per cent. subsequently incurred an average annual sick absence, for digestive and other disorders, amounting to a month or more, and 26 per cent. an average absence of 14 to 28 days. The subsequent average annual sick absence of the manual, more physically active, workers was substantially the higher.

Of 150 manual and non-manual workers, who had been operated upon for gastric ulcers 30 per cent. subsequently incurred an average annual sick absence of a month or more, and 29 per cent. of 14 to 28 days; and here again the average yearly sick absence of the manual workers was considerably higher than that of the non-manual workers. Nine of the duodenal ulcer group and 15 of the gastric ulcer group underwent further operative treatment for ulcer recurrence, at periods varying from eight months to eleven years after the first operation. Subsequent observations since 1935 have confirmed this general after-history picture as far as working capacity in industry is concerned.

The recruit for the rough-and-tumble life of the Army, with a previous history of duodenal or gastric ulcer, must therefore, as Dr. Izod Bennett suggested, be regarded as an extremely doubtful proposition. Unless there has been a well-attested history of complete freedom from signs and symptoms for at least 3 or 4 years the bias should probably be against acceptance, both in the interests of the Army and the recruit himself.

I am, Sir, yours faithfully,

London, E.C.1. H. H. BASHFORD.

SIR,—Between 1920 and 1930, when most surgeons claimed that not more than 1 or 2 per cent. of their gastro-jejunostomies developed anastomotic ulcers, I was seeing more patients suffering from the ill effects of the operation than primary cases of gastric ulcer, and disconnecting gastro-jejunostomies became for a time the gastric operation I had most frequent cause to recommend. Now after another ten years many British surgeons have at last come to the conclusion their American and continental colleagues reached long ago that gastro-jejunostomy for uncomplicated duodenal ulcer is an unsatisfactory operation. Meanwhile the advocates of partial gastrectomy for duodenal ulcer are as pleased with this operation as their predecessors were with gastro-jejunostomy. It is true, as Professor Pannett remarks, that their successful cases are so well that they are not often seen by physicians, but it is equally true that their many failures, which we do see, are so ill that they are generally afraid to revisit the surgeon who performed the operation. I have myself seen about thirty such failures, in which severe symptoms caused by gastro-jejunitis, with or without acute or chronic ulcers, have followed partial gastrectomy performed for peptic ulcers.

Unfortunately it is often impossible to cure these cases by medical treatment. But the surgery for unsuccessful partial gastrectomy is much more difficult than the already difficult surgery for unsuccessful gastro-jejunostomies. Occasionally nothing short of complete gastrectomy is of any use; this formidable operation has been performed on two of my patients by Mr. Gaymer Jones with excellent results. I should none the less hesitate to send them on active service, although, having no stomach, they secrete no gastric juice, so that recurrence is impossible. They are thus much safer than the victims of partial gastrectomy, who would be cheerfully encouraged by Professor Pannett to expose themselves to the rigours of a winter campaign. I gather that he even advocates the performance of partial gastrectomy or gastro-duodenectomy on serving soldiers, advice which would certainly lead to many deaths and much needless suffering at a time when unavoidable casualties are happily very few in the British Expeditionary Force. As Dr. Izod Bennett remarks in his letter to THE LANCET of March 16, the suggestion seems so absurd as to be almost incredible.

I am, Sir, yours faithfully,

Oxford. ARTHUR F. HURST.

SIR,—In his letter of March 16 Dr. Izod Bennett quoted anonymous high authority as having spread a claim that many young recruits with peptic ulceration could be made fit for service by gastrectomy in some form. Most of his letter is concerned with his experience of officer patients. He draws no distinction between the clinical problem of the officer and that of the other ranks. The dyspeptic officer, with or without gastrectomy, can always select the food that is best for him, and regulate the strength of his tea. The sailor, soldier or airman, however, has to eat what is put before him. A "chit" to the cookhouse from the M.O. is an ineffective nuisance.

Professor Pannett supports the well-founded surgeons' claim that many a patient who has had part of his stomach extirpated can undertake full manual labour. There are many service occupations which entail little manual labour and the real criterion is diet. Professor Pannett fails to point out the difficulties of diet for the man in the ranks. Even the most optimistic gastrectomist will require three to six months for his patient on a diet somewhat lighter that "rations." The symptoms of gastric distress after operation are hard to refute, and it has to be remembered that some at least of the very few men in the ranks suitable on other grounds for gastrectomy will decide after sick leave that civil life is best, and they will finally be discharged. Though many civilians recover completely and return to heavy work, before a surgeon undertakes an assault on the stomach of a soldier he should consider, in fairness to his patient, whether that man can be guaranteed the necessary post-operative regime, and whether should this period be prolonged the resulting burden to the state really justifies the initial operation being done in the service.

In selecting men from the ranks for gastrectomy I would suggest that the following points should be ascertained, possibly in consultation with non-medical officers:

(*a*) Is the man's previous training of such length and degree that he could rightly be maintained on the service strength as "non-effective sick" for at least six months?

(*b*) Will retention in the service after operation jeopardise his chance of complete recovery, or is it likely to lead to a claim that his condition has been aggravated by service conditions? If discomfort does persist, it is hard to deny the man's right to such a claim.

(*c*) Is posting to a unit where the patient can "live out" (in a home of his own, regulating his own diet) possible? Compassionate posting in war-time may be difficult, but may also be the deciding factor.

(*d*) Does the man genuinely want to remain in the service?

I have already met men who will gladly use the service facilities to obtain their operative treatment and convalescence on full pay, but whose persistent doubtful symptoms lead to the "invaliding" they have desired. Malingering still exists and half a stomach makes a good start. Many of the ulcer cases we are seeing now are men who failed to disclose the condition of which they were fully aware when, before war overtook them, they enlisted in the reserves. They believed their stomachs could answer a call that might never come. They belong to the middle-age group of which Professor Pannett speaks. Very few would be good investment for the state if they submitted to gastrectomy. It is fairer to all concerned to release them from service. They can still receive operative treatment as civilians.

The formation of a "gastric" company, command or crew for dyspeptic officers and men, might solve the question of diet, but the nervous element in the excitation of peptic ulceration is difficult to control under conditions of active service.

I am, Sir, yours faithfully,

Cranwell. D. F. ELLISON NASH.

FRACTURED FEMUR IN CONVULSION THERAPY

SIR,—The subject of Dr. Good's letter in your issue of March 23 is one of topical interest in practical psychiatry of to-day and deserves a fuller discussion in which not only psychiatrists but also surgeons and radiologists should take part. All points raised by Dr. Good are controversial. With regard to his statement that "age or prolonged inactivity bear no relation to the incidence of fractures" we would point out that in a series of 144 cases treated at the Crichton Royal, of whom 25 were over fifty years of age, fracture of a long bone occurred in 3 patients. All were females in the 6th decade of life who had been hospitalised for several years. Dr. Good thinks the incidence of fractures in his series, 2 in 160 cases treated—i.e., 1·25 per cent.—exceptionally low. One of us (A. M. W., *J. ment. Sci.* March, 1940, p. 248) has made a study of the literature and found that in the series where the fractures were actually reported, there were 28 fractures in 2342 cases—i.e., 1·20 per cent. If therefore the incidence of fractures in Dr. Good's series is not less than in the general experience his argument that restraint is the principal cause of these fractures loses most of its ground. As a matter of fact no worker advocates forcible restraint of the patient during the tonic phase of the fit—i.e., at the time when in our experience fractures occur. During the initial phase of clonic jerkings our nurses are instructed gently to support the arms and to keep the elbows close to the sides, preventing abduction at the shoulders in order to minimise the risk of dislocation. It is improbable that this procedure can have the effect of causing fractures.

We agree with Dr. Good that there is no essential difference between the fits of idiopathic epilepsy and those induced by Cardiazol, although the latter seem to be of shorter duration and greater intensity than the former. Great variations exist in the character and intensity of grand-mal attacks, not only of different epileptics but also of the same epileptic. This is also true of convulsions induced by drugs and the aim of course is to induce the mildest complete convulsion. The infrequent occurrence of fractures in epileptics is probably due to the fact that in most cases their bones have been habituated to the strain of fits from youth.

We are, Sir, yours faithfully,

ANDREW M. WYLLIE,
Crichton Royal, Dumfries. W. MAYER-GROSS.

THE E.M.S. TODAY AND TOMORROW

SIR,—Many must have read with great interest the article by Sir James Walton in your issue of March 16. Sir James has learnt something from the war and is frank enough to admit it. Like a good many other members of the E.M.S. he has for the first time made personal contact with the municipal hospital service that provides accommodation for three out of every four of the citizens of London, when they need hospital treatment. He has found that in personnel, in elasticity and in capacity for getting things done this service is a very different thing from what he had imagined and he is honest enough to say so.

So far I am in entire agreement. I agree also in what may be assumed from this article, although it is not perhaps definitely stated, namely, that it is wasteful and absurd to have two hospital systems doing the same sort of work and yet more or less in competition with each other. There is one minor inaccuracy in the article. It is not strictly true to say "In the permanent state hospitals the great drawback to the medical man is that as he advances in his profession he ceases to be a doctor and becomes a pure administrator," for the London County Council has a few clinical appointments with salaries of £1500 a year and the Middlesex county council several. Moreover, in so far as the statement is correct at all, it is merely an indication that the evolution of these hospitals, taking origin as they have done but a few years since from poor-law institutions, is not yet complete.

Sir James goes on to say "It is now that a definite plan should be formulated so that if there be a union between the state and voluntary systems the good that is in each system may be retained and the bad eliminated." He proposes the formation of a committee to formulate such a scheme. When, however, he suggests that such a committee "should indeed be a British medical association of all consultants participating in hospital work," I think he is wanting to restrict the membership too much. Surely those who are actually engaged in the work of the municipal hospitals will have something to contribute. Moreover, could not something be learned from laymen who have had experience in hospital administration and are also able to speak from the consumer's point of view?

Sir James then sets out three essential provisos for the new service. "(1) The surgeon or physician in charge would have to remain a doctor with complete control of his unit and would be freed of all administrative work. (2) He would have to be provided with private rooms and consulting-rooms where he could treat better-off patients at moderate fees, so that he could mix with all grades and could obtain some added reward for his labour and reputation. (3) He would be given full facilities for undergraduate and post-graduate teaching." With the first and third of these I am in entire agreement; with the second I profoundly disagree.

After a good many years in private practice I have come to the regrettable conclusion that I have learned nothing from my private patients that I could not have learned much better from those seen in hospital. Admittedly, I have met interesting people and made many friends, but professionally I have little doubt that I should be a better man today had I never seen a private patient. Sir James takes the view that the consultants' "private relationships guard them from the danger of coming to regard all patients merely as cases." The very reverse of this appears to me to be the truth. I think it was Mr. T. B. Layton who pointed out that the consultant who makes his living from fees paid by about 10 per cent. of the population may easily fail to realise the importance of the other 90 per cent. If he does not regard these "merely as cases" he may easily look upon them as creatures very different from his private patients.

But however that may be, it must inevitably happen that where two sorts of patients are seen there will be a tendency to provide two sorts of treatment. Conflicts between hospital and private practice are bound to arise, and it is all too easy to fail to give adequate consideration to hospital patients when there are private cases clamouring to be seen and willing to pay large fees. How easy it is for the busy consulting surgeon to leave his registrar to undertake alone operations which he knows quite well he is hardly capable of performing. Sir James may recall that not so many years ago a surgeon of a large London voluntary hospital was made to resign because he had so frequently put off hospital operations in favour of private work.

The alleged danger of a whole-time system with a set salary and pension leaves me cold, because I know that in the municipal services the salary is not set but depends on progress in the service, which again is determined not merely by the whim of patients as in private practice but by those able to assess the individual's real value. No-one will deny that the hospital service of the future should conserve the best of both the voluntary and state systems. I am not convinced, however, that the part-time employment characteristic of the former is worthy of retention.

I am, Sir, yours faithfully,

London. SOMERVILLE HASTINGS.

THE BIRTH OF THE E.M.S.

SIR,—I am attracted by the letter from Sir Charles Wilson in your last issue in which he says that after July, 1938, he was only a pawn in the game and could no longer influence policies. We must be fair to the Ministry of Health whose policy was guided by professional advice which they took pains to get. Thus we have been told by the Secretary of the British Medical Association (*Lancet*, Feb. 10, p. 292) that it was the Central Medical War Committee which advised the ministry in July, 1939. Dr. Anderson also said that the ministry decided before the war that the majority of London consultants should be recruited on a whole-time basis and that this decision was based on the advice given by its Group Officers. Sir Charles Wilson, being a group officer, must have had a finger in this pie. Will he tell us that he was a member of the Group Officers' Committee and not responsible for the advice they gave? It would be interesting to see the minutes of the meeting at which this decision was taken.

But there is a broader issue involved. The Emergency Medical Service as originally constituted has already had to be considerably modified. In the near future further considerable modification of its structure and of the terms of service of its personnel will be made. Now is the time to determine that the voice of those who advised the Ministry of Health in the building of this service is not heard again.

I am, Sir, yours faithfully,

Mansfield Street, W.1. GEOFFREY EVANS.

SIR,—One had hoped after Dr. Anderson's letter in your issue of Feb. 10 that one had at last assigned responsibility authoritatively for the "birth of the E.M.S." The secretary of the Central Medical War Committee, it will be remembered, arrogating to himself supreme authority to speak for the E.M.S., placed the responsibility squarely on Sir Charles Wilson's committee. Sir Charles is able to show, and I accept his correction unreservedly, that Dr. Anderson was mistaken both in the date of formation and in the activities he ascribed to Sir Charles's committee, and one is thrown back, therefore, until one receives more authoritative information, on the explanation given by the minister to Parliament on Oct. 26 when he indicated very clearly that the operative accoucheurs at the delivery of this ill-conceived infant the E.M.S. were:—

(i) The Central Emergency Committee of the B.M.A., later called the Central Medical War Committee.

(ii) The group officers of the sectors, constituting a committee of some 19 consultants receiving whole-time salaries of £1300 a year.

It follows from this statement that Sir Charles Wilson is much too modest in representing himself, after the unaccountably swift demise of his committee (which seems to have died, like the drones, in the act of fecundation), as a mere "pawn," unable to influence subsequent policies. Sir Charles, as a member of both bodies referred to by the Minister, would be more properly described as a "major piece" on that particular chess-board; indeed in view of the catholicity of his committees, he might be compared to the most ubiquitous protagonist in the chess-team, the queen herself.

I find some difficulty in reconciling Sir Charles Wilson's present obvious reluctance to acknowledge his inescapable share of responsibility for the E.M.S. with his eulogy of that service in his letter to the *Times* of Dec. 6 which ended with the pontifical pronouncement: "The physicians and surgeons of the Emergency Medical Service have built better than they knew." In that letter, dated by an unfortunate inadvertence from the Ministry of Health, and thereby implying a sanction which was in fact wholly unauthorised, he argued at great length the surprising thesis that medical education, far from being disorganised, was being actually conducted in the outlying sector-hospitals better than in the London medical schools. In an answering letter in the *Times* Lord Dawson pointed out the obvious danger to those schools if such a thesis were admitted and I may mention in support of that warning that in 1937–38 the court of London University distributed to its twelve medical schools no less a sum than £118,000 in respect only of their teaching, apart from large sums for other purposes. This expenditure may very well come to be questioned if the value of the teaching were impugned.

But consideration of the genesis of the E.M.S., while important historically, is less urgent than consideration of its continuance, under present conditions, so contrary to expectation. The radical reorganisation of that service as regards the honorary staffs of voluntary hospitals carried out by the Minister of Health last November makes the return of medical students to London, at least in their clinical years, an immediate and pressing question which is engaging

the anxious attention of London University. In other faculties as well as in medicine the advisability of the return of its schools to London is being actively discussed; but I shall deal here only with the medical situation. Will it be possible, to take only one aspect of the problem, to satisfy the university that adequate clinical material for teaching the full complement of students will be available while the present restrictions are enforced on the use of the beds for teaching at the schools? I recall in this connexion a debate at the senate in 1916, when the proportion of beds to students at a certain school had shrunk so seriously that a proposition to discontinue recognition of the school was only narrowly defeated. The latest information from the King's Fund regarding the present allocation of beds at the teaching hospitals shows that rather less than a third of the total are assigned to the civilian sick and therefore available for teaching purposes; about a third are retained for casualties by the Ministry of Health and the remainder are out of action for various reasons. But probably some three quarters of the teachers in the clinical subjects have now been released from whole-time service so that it is the paucity of beds that makes the present principal difficulty.

The question and conditions of maintenance of the Emergency Medical Service must shortly come up for decision; a debate in Parliament on the war-time measures of the Ministry of Health is imminent. The medical profession was, I submit, caught napping in the formative period of 1938–39 when so many disastrous decisions were taken. It has paid very dearly for its indolence and apathy. Will it allow the costly blunders of the past to be perpetuated, or will it now bestir itself to retrieve the position as far as may be possible?

I am, Sir, yours faithfully,

House of Commons. E. GRAHAM-LITTLE.

BREECH PRESENTATION

SIR,—We strongly welcome the article by Mr. Vartan as a fresh attack on those unproved assumptions that are copied from one textbook on midwifery to another until, by mere repetition, they come to be accepted as true. It is, then, all the more to be regretted that, although his conclusions may be true, his argument is quite unsound. He has shown that extended legs are present in a large proportion of breech presentations, but before he can argue that this is one of the causes of the presentation he must show that a similar extension of the legs is absent or at any rate less common in vertex presentations. Radiograms show that the legs of the fœtus, whatever the lie, do assume any degree of flexion at the knee and that the complete flexion which is illustrated as the normal in textbooks is as uncommon as complete extension. From an examination of over 100 radiograms of pregnancy the following figures have been collected, discarding films in which the position of the legs was not clear or where abnormalities of the fœtus were present:—

	Legs flexed	Legs extended	Total
Vertex	23	14	37
Breech	4	24	28
Total	27	38	65

The value of Yule's coefficient of association for this table is 0·816, so that there is certainly a high degree of association between extension of the legs and breech presentation; we have not, however, proved that this association is necessarily due to cause and effect.

It is surely time that the writers of textbooks on midwifery made use of the facts disclosed by X rays; to take two obvious examples, the fœtal head engages, not in one of the diagonals, but in the transverse diameter in more than 80 per cent. of all cases, and various degrees of extension of the head producing face or brow presentations are not very uncommon before labour begins, and may be altered to complete flexion by labour itself.

We are, Sir, yours faithfully,

CLARK NICHOLSON,
J. E. JAMESON.

District Hospital, Moreton-in-Marsh.

MINERS' NYSTAGMUS

SIR,—In his letter in your issue of March 23 Mr. D. Leighton Davies says: "During the past 15 years or more the lighting in coal mines has been vastly improved by the substitution of electric lamps for the old safety oil lamps: yet there has been no decrease in the incidence of the disease." The following figures may therefore interest him.

Nystagmus at Mines under the Coal Mines Act in Great Britain. Number of New Cases for which compensation was paid.

Year	Number of new cases	Rate per 1000 persons employed underground	Year	Number of new cases	Rate per 1000 persons employed underground
1923	3872	4·01	1932	1962	3·04
1924	3271	3·39	1933	1535	2·48
*1925	3444	3·92	1934	1745	2·83
1927	1801	2·21	1935	1839	3·06
1928	2554	3·43	1936	1522	2·55
1929	2577	3·38	1937	1165	1·89
1930	3066	4·15	1938	†1019	1·66
1931	2729	3·98			

* 1926 omitted owing to prolonged stoppage.
† Provisional figures.

Information given me during my numerous visits to mines indicates that this decrease in the number of new cases is being maintained.

With regard to various theories put forward about gases, posture, bacteria, psychoneurosis, &c., it seems often to be overlooked by those who discuss the subject that miners' nystagmus does not occur among men who have worked only in naked-light mines.

I am, Sir, yours faithfully,

S. W. FISHER,
H.M. Medical Inspector of Mines.

Mines Department, London, W.1.

"ARMY WANTS LAMBETH'S DOCTOR"

SIR,—The annotation on page 606 of your issue of March 30 appears to reflect on the individual concerned where it says "It is a matter of surprise that Major Thompson . . . has not yet joined the British Army." The question of Dr. Thompson's war-time service has been largely outside his own volition, and was in fact decided in the end by private discussion between the Secretary of State for War and the Ministry of Health. The suggestion, however unintentional, that a M.O.H., who after serving in the last war has been for seventeen years actively engaged in public-health work and is now responsible for the A.R.P. casualty services of a vulnerable area, has personally evaded his duty in another direction should be instantly rebutted. Moreover, there are already

medical officers of health, of equal experience with Dr. Thompson, serving in the R.A.M.C. in positions not particularly fitted to their special experience; the War Office could presumably have transferred one of these to the kind of work which you mention.

The general question of the release or retention of public-health-service personnel is a difficult one which is better kept out of the sphere of public controversy, and should be decided between the local authorities and the Local and Central Medical War Committees, or by reference to higher authority. There is no unwillingness on the part of the public-health medical officers to undertake their full share of military service proportionate to that of other sections of the profession, but it should be remembered that, unlike their colleagues, they are not their own masters in this matter.

I am, Sir, yours faithfully,

G. L. C. ELLISTON,
Executive Secretary.

Society of Medical Officers of Health, London, W.C.1.

*** We understand that the Ministry of Health have informed the Lambeth borough council that Dr. Thompson is not to be released for military service. —ED. L.

QUININE INJECTIONS

SIR,—I have read the article in your issue of March 9 on clinical malaria in children with great interest. I hope, however, Dr. Cicely D. Williams will permit me to differ from her in one instance—regarding the technique for intramuscular injection of quinine. I should like to point out the advisability of discarding the use of quinine bihydrochloride for that purpose, as its solution is too acid (pH = 3·5). The disadvantages of this (pain, local necrosis and thereby danger of infection) can entirely be avoided by using one of the newer preparations. For injection purposes quinine hydrochloride is much better suited, when combined with urethane or with antipyrin to increase the solubility :—

℞ Quin. hydrochlor. .. .. gr. 10
Urethani .. .. .. gr. 5
Aq. dest. .. .. .. ad 2 c.cm.
f. sol. steril. (pH = 6·1)

or: ℞ Quin. hydrochlor. .. .. gr. 10
Antipyrini .. .. .. gr. 5
Aq. dest. .. .. .. ad 2 c.cm.
f. sol. steril. (pH = 6·5)

I am, Sir, yours faithfully,

C. W. F. WINCKEL,
Malaria Adviser to the Amsterdam Psychiatric Clinics.

COÖRDINATION IN EXCELSIS

SIR,—The regional office of the Ministry of Health has asked for returns in triplicate showing the strength of the first-aid posts and ambulance units, the return to be made up to March 31 and thereafter quarterly. Pink and yellow forms have been supplied for the purpose and no doubt it was fascinating work to the civil servants in the regional office devising the forms and selecting the colours.

It so happens in this district that the regional office of the Ministry of Home Security is housed next door to the regional office of the Ministry of Health. Also it so happens that the regional office of the Ministry of Home Security receives exactly the same information every month, but of course on quite different forms. This is one of many instances where the energy of local authorities in a so-called total war is being dissipated by the total absence of common sense on the part of government officials. Obviously it is impossible for officials in the same region, in the same road, and almost in the same house to pool their information in the interests of economy and efficiency. On the contrary, it would be against all the traditions of our great civil service whose object appears to be to create the maximum amount of work with the minimum of progress.

I am, Sir, yours faithfully,

MEDICAL OFFICER OF HEALTH.

THE YOUNG OFFICER

SIR,—In your issue of March 30 (p. 628) you castigate the youthful house-officer for imagining himself entitled to be a specialist in the Services. The fact is that this person imagines nothing of the sort. Many, however, were hoping one day to become specialists and were working hard to that end. Their day-dreams have been shattered. There is room in the Services for specialists, but not for training them. This may be a war-time necessity but it is scarcely a matter for congratulation nor for the complacent damper you administer to the enthusiastic young. I am in no position to criticise the R.A.M.C. but its professional reputation is not as high as it should be among many, both inside and outside the profession. A small voice suggests that this may be due to the policy of requiring the budding clinician to be a soldier first and a doctor last.

I am, Sir, yours faithfully,

Reading. T. L. STOATE.

PRIMARY SUTURE OF WAR WOUNDS

THE practice employed in the Spanish civil war of treating war wounds by primary suture and the application of plaster, without any attempt to remove splinters of bone and other foreign bodies at the first operation, came in for criticism at the meeting of the French Academy of Surgery on Jan. 17. Dr. Roux-Berger painted a gloomy picture of the patients thus treated when they arrive at a base hospital with fœtid suppuration under the plaster and no alternative to a radical operation. Dr. Chevassu pointed out that in the last war the surgeons who ventured on primary suture were men of great experience and were entitled to take big risks. Primary suture, he said, is permissible only in the hands of surgeons who have learnt to appreciate all its implications and possibilities for mischief. Professor Gosset joined in the chorus of condemnation of primary suture as a short-cut to be practised wholesale, more particularly in wounds of the muscles, because of their liability to gas gangrene. Wounds of the joints may end in arthritis as a sequel to primary suture, but there is not the same tendency to the development of gas gangrene. The general sense of this discussion seems to be that it is well to remove as completely as possible all splinters of bone and other foreign bodies at the earliest opportunity. One speaker even went so far in defence of esquillectomy (*esquille* a splinter) as to record a case in which two hours had been spent over this procedure.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES.—In order to reduce overcrowding and waiting this hospital has arranged that after April 15 new outpatients will be seen by appointment only. Practitioners who refer patients to the hospital are asked to coöperate. Appointments may be made by telephone, letter, or personal application.

OBITUARY

JOHN DOUGLAS CAMPBELL WHITE

M.D. CAMB.

Dr. White, who died at Harrow-on-the-Hill on March 25, was a practical idealist and one of the pioneers in the campaign against venereal diseases, which took effect at the beginning of the last war. Born at Rutherglen, Glasgow in 1871, he was educated at Charterhouse and Trinity College, Cambridge, qualifying in 1904 from the London Hospital where he held house appointments. Later he became assistant in the inoculation department there and at the Lister Institute. At this time he was already interested in economic problems, contributing articles to the weeklies on income-tax reform and the future of venereal disease. When the National Council for combating venereal diseases was founded he became its hon. secretary and in 1916 was responsible for a synopsis of the final report of the Royal Commission which had a wide circulation. During that war he served in various capacities, as president of a pension board and acting commissioner of medical services, but his great service was as lecturer on venereal disease; his appeal must have reached an aggregate of 100,000 soldiers. After the war he visited Istanbul at the invitation of the Y.M.C.A. and lectured to troops there, and later Singapore and Malaya. All his professional life he lived in Harrow, where he was a member of the urban district council and its chairman for two years. On the death of his uncle, Lord Overtoun, he succeeded to the property in Dunbartonshire and last year presented the mansion and its holding of 90 acres to the burgh of Dumbarton. In 1898 he married Lucy Agnes, daughter of I. H. M'Clure, writer, of Glasgow, and their son is at present serving with the R.A.F.

ARTHUR CORRIE KEEP

M.C., M.D. EDIN.

Mr. Corrie Keep, consulting surgeon to the Samaritan Hospital, died on March 26 at the age of 79. Born at Wollaston, near Wellingborough, where his father owned property he retained his love of the country and field sports, becoming himself lord of the manor of Kilby in the same county. Later in life he bought an estate in Kent. He took his schooling at Caius House, Cambridge and Tettenhall, studying medicine at Edinburgh University where he qualified in 1882 taking his M.D. three years later. As a student he played rugby for the university and was reserve for Scotland. After leaving Edinburgh he was house-surgeon to the Guest Hospital, Dudley, and assistant in the anatomy department of the Middlesex Hospital. His first honorary appointment was to St. Saviour's Hospital. Later when he was elected to the staff of the Samaritan Hospital he was junior to W. A. Meredith who had worked with Spencer Wells. Keep was a first-class operator and by no means confined himself to gynæcological surgery. During the late war he joined the R.A.M.C. at the age of 54, was awarded the military cross for attending the wounded under fire, and retired with the rank of major. These years, writes a colleague, were among the happiest of his life, as he fitted in well with his battery in France; if he had not got everything he desired in the way of surgical equipment he would purchase what he wanted when on leave rather than wait for things to arrive through official channels. After the battle of the Somme he had symptoms of cardiac dilatation and on his return to England gave up both his hospital and his private practice. He settled on his country estate near Woodchurch, Kent, spending a few months each year in London. His hobbies were shooting, which he kept up till recently, and the collection of old furniture on which he was expert. He was unmarried.

CHARLES MILTON FEGEN

M.R.C.S., L.R.C.P.E., D.P.H.

Dr. Fegen was born at Harwich in 1861, educated at Bedford Grammar School and studied medicine at St. George's Hospital from which he qualified in 1885. After some years in general practice during the latter part of which he was adviser to the Ampthill rural district council he was appointed medical officer of health to the Croydon rural district with charge of the isolation hospital at Mitcham and the joint small-pox hospital. Having obtained the D.P.H. in Dublin he began to take a prominent part in public-health activities and became Edward Jenner lecturer in public health and epidemiology at his old hospital. One who worked under him as sanitary inspector speaks of his gift for handling people in all walks of life. He expected good work from his subordinates and the confidence he placed in them ensured his getting it. "As a chief," she adds, "he was without equal, just, helpful and above all trustful. The spectacle of life, I think, amused him but what amused him even more perhaps was himself in the leading part upon his own stage." When war broke out in 1914, although then over 50 years of age, he joined the R.A.M.C. with the rank of major, saw active service in Salonika, and was mentioned in dispatches. His association with the London and Counties Medical Protection Society began with membership of the original council when the society was registered in March, 1892. He became treasurer in 1914 and from 1913 was chairman of council, resigning this position in 1931 to serve the society in the capacity of secretary for another six years. His shrewd common sense enabled him to see a way out of the many baffling difficulties on which he was consulted and he was often successful in healing the quarrels between medical men. In this he was helped by a transparent honesty and friendliness that made him an agreeable colleague in office or council chamber. But this was only one of his many-sided public activities; he excelled as a chairman and was often asked to preside at meetings. He was on the executive of the National Society for the Prevention of Cruelty to Children, a rotarian, a keen supporter of the British Legion and a chairman of school managers. His long illness was borne with a patience surprising in a man with so vigorous a mind. He retired to Dunsford, Surrey, where he died on Easter Monday.

Sir Cuthbert Wallace writes: My association with Fegen was of comparatively short duration and it was naturally some time before I as a newcomer was able to grasp the business and appreciate his qualities. When I did I recognised that in Fegen the L.C.M.P.S. had a wise and experienced servant. To know what to do and what advice to offer to a doctor in distress demanded not only a calm and wise head, but a knowledge of all the circumstances of medical practice, of the rules of ethics, and of all the legal enactments that govern the doctor's life. I know well that many who consulted him in worry and anxiety went away relieved in mind, convinced that they had received sound advice and been put in the way of overcoming their trouble. The effect of good advice offered to

any of us depends in great degree on the way that that advice is put to us and Fegen had the knack of putting it in such a way that it went well even if not altogether palatable—a very great achievement. He was liked and esteemed by us all.

Prof. AUGUST BORCHARD

AFTER a long illness Professor Borchard of Posen died on Feb. 19 in his 76th year. A pupil of Marchand and Braun, Borchard proved himself an all-round surgeon with an eminently international outlook. He made several contributions to the study of syringomyelia and abdominal surgery, and published a valuable textbook of surgery in association with Garré and one on war surgery with Schmieden. He threw himself heart and soul into editing the *Zentralblatt für Chirurgie*, and was the mainspring in several respects of the annual meetings of the Deutsche Gesellschaft für Chirurgie. His genius for organisation made him invaluable when international meetings were to be held. His literary and social activities did not, however, prevent his taking an active part in the last war as a consultant surgeon. He was honorary member of various learned societies in different parts of the world.

Dr. MAPOTHER

Two pupils now serving in the Royal Navy write: Mapother was an ideal chief to work under. While he had little use for uncontrolled speculation in the young—or, for that matter, in the old—he was always ready to help forward any project which held out a reasonable hope of advancing the science of psychiatry. His own views have been set out with brief precision in the section on psychological medicine of Price's textbook. Here his teaching is epitomised. Its key-note is to be found in his own words in an early report—"enthusiasm without illusions." No-one can think of Mapother's teaching without thinking also of his quick Irish wit, for the two were so closely linked. "What did you think of that presidential address, Sir?" one of us asked him. "Pontifical superficiality," he replied. He gave great credit to Freud, but his over-enthusiastic followers sometimes got short shrift. He did not belittle the sexual side of life. Indeed he had no use for those who, as he said, "wore fig leaves over their minds." But he refused to accept the view that sex and life were synonymous. Psycho-analysis he once described as a system of selective retrospection based on the principle that nothing is too banal to be important provided it is sufficiently remote. He had little patience with "psychological ferreting" after problematically existent rabbits. Such activities he felt were best left to the "therapeutic chanticleers." His clinical judgment was of the highest order and his descriptions of patients were as witty as they were accurate. What could be a better summing up of a certain type of hysterical activity than "scintillating futility"? He had too an endearing absent-mindedness as when he joined in the clapping of his own speech on sitting down at a medical meeting.

He was the bravest of men and would willingly sacrifice himself for his ideals if it would serve a useful purpose. When psychiatric demonstrations were being started at St. George's Hospital he did not hesitate to come himself to initiate them, in spite of severe dyspnœa and two other public engagements earlier in the day. He could easily have deputed the work, but his psychiatric conscience was such that he would spare no effort in the furthering of his science. Knowing himself to be dying he spent the last months of his life at work on plans whereby his special experience might best serve his country. On a visit to him a few months ago when he was breathless and unable to walk, one of us asked him about his health. He replied "My heart has let me down. Now let us talk about psychiatry in the Navy." And at the end of the visit he rather shyly enquired whether he might be of any help abroad; for he knew he would not live through another winter in England.

EDWARD GEORGE REYNOLDS

M.B. LOND., LIEUTENANT, R.A.M.C.

Lieutenant Edward Reynolds died on March 4 after an illness of only 24 hours. He had been treating a case of cerebrospinal fever and had himself contracted the disease.

He was born on Jan. 13, 1913, the son of Mr. R. G. Reynolds of Beadon Prior, Salcombe. He took the first M.B. examination at University College, Swansea, in 1931. The following autumn he went to London where he studied anatomy under Mr. John Kirk. He entered St. Bartholomew's Hospital in 1934 and three years later qualified M.R.C.S. He took his M.B. Lond. in 1938. After acting as casualty house-physician for three months at Bart's he was appointed house-physician to Dr. Geoffrey Evans. This appointment finished in November and in January of this year he joined the R.A.M.C. and was appointed medical officer to the 28th (Essex) A.A. Battalion, R.E.

Dr. Geoffrey Evans writes: When the hospital was partially evacuated at the outbreak of war Reynolds became senior resident medical officer at Cell Barnes Hospital, near St. Albans. We lived and worked together there for the first two months of the war, and during this time my previous impression of him as a man of character and understanding strengthened. It was evident that he had the best influence on his patients that a doctor can have. They trusted him. His presence and understanding helped them. His clinical work was of a high order. He had a hunger for knowledge, not only as a means of helping his patients, but also for its own sake. Reynolds had already developed many satisfying interests in life. He loved the country, and on one of our walks he told me of two fields at home that belonged to him with a stream running through them. He had a vivid picture of them in his mind. His untimely death is a sad loss to all who knew him.

Dr. LOUISA ROSA COOKE, who died at Hunstanton on March 23 at the age of 90, was for fifteen years physician to the household of the Emperor of Korea. She qualified L.R.C.P.E. in 1890 and after a period as resident medical officer at Babies Castle, Hawkhurst, Kent, she left for Seoul, the capital of Korea, about the turn of the century. Besides her imperial appointment she acted as physician and surgeon to the Dispensary for Women and Children at Seoul. Dr. Cooke also worked among women and children in India and for many years she served the dispensary for women and children belonging to the Jasidin East India Railway Company at Behar. On her retirement at the age of 80 she returned to England where she was an associate of the sisterhood of Ditchingham.

PARLIAMENT

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE House has returned after the Easter recess in the mood to support the Government in any measures, even drastic measures, which it may feel obliged to take to tighten up the blockade of Germany. The Prime Minister found no voice raised against him when he indicated that the blockade procedure might have to be considerably tightened up. Mr. Attlee, for the Opposition, had no criticism to make nor had the Labour back benches. A realisation of the gravity of the task before us is become deeper.

After Mr. Chamberlain's speech the House turned to the estimates on which the question of food prices was debated. Mr. John Morgan, who is Labour member for Doncaster, opened the debate with an indictment of the methods of food control and a denunciation of the rise of prices. Prices of food have risen more steeply since the beginning of the war than they did at the beginning of the other war of 1914–18. Mr. Lennox Boyd in his reply defended the employment of trade experts to help in the work of food control in departments dealing with the commodities in which they themselves were interested. Their service, he said, was a disinterested public service and there seems every reason to think that this is true. The margarine expert pools his knowledge with that of civil servants and his views are of course subject to check and control by the minister. And this pooling of ideas has produced some better brands of control than the pooling of some other commodities. Mr. Lennox Boyd was able to point to the fact that while the rise in the prices of the two higher-priced grades of margarine had been made to meet the extra cost of raw material the lowest-priced margarine had remained stable at 5*d*. To those who demanded a decrease in the price of butter Mr. Lennox Boyd presented the fact that a subsidy to enable the price to be reduced by 3*d*. a pound would cost about £17,000,000 a year. In view of the fact that all margarines were now vitaminised he did not think that this expensive reduction of price in the "luxury" butter could be justified.

And so at about 9 P.M. to the vote For the Government 160, Against 117—and then "Who goes home?"

QUESTION TIME

Mental Capacity of Recruits

Mr. WILSON asked the Secretary of State for War whether he had considered representations that tests are available which gauged the mental capacity of recruits; whether any such tests had been carried out; and, if so, how many recruits had been found to be defective and what proportion these bore to the numbers examined.—Mr. OLIVER STANLEY replied: it is not considered practicable, in present conditions, to adopt a system of tests for gauging the mental capacity of recruits, and no such tests have been carried out.

Army Medical Appointments

Mr. GROVES asked the Secretary of State for War if he would state the constitution, personnel, and functions, of the committee of reference which was working in conjunction with the Central Medical War Committee in connexion with appointments of medical practitioners as surgeons in charge of divisions; and why, as such appointments carried the rank of lieutenant-colonel, they were not made by way of promotions from the R.A.M.C. instead of by the Central Medical War Committee.—Mr. STANLEY replied: The committee of reference is composed of representatives of the Royal Colleges of Surgeons and Physicians and of the British College of Obstetricians and Gynæcologists, and advises the Central Medical War Committee in relation to the consultant and specialist staff of the voluntary and municipal hospitals in the London area only. They also consider the professional suitability of specialists in the London area who have volunteered for the medical services of the armed forces and whose names are submitted to them by the C.M.W.C. Recommendations for specialists outside the London area for service with the armed forces are made by a subcommittee of the C.M.W.C., which subcommittee includes distinguished consultant surgeons. The appointments referred to are made by selection from officers of the R.A.M.C. or from suitable civilian surgeons who volunteer for service with the Army.

German Books

Mr. KEELING asked the President of the Board of Trade whether the purchase from Germany of German books and periodicals was permitted during the war.—Sir ANDREW DUNCAN replied: The purchase of books and periodicals published in Germany is prohibited except under licence from the Board of Trade. The only licences granted have been for technical and scientific works and for a few other publications required here by responsible persons for purposes of national importance.

Paratyphoid in Glasgow

Mr. GROVES asked the Secretary of State for Scotland whether he was aware that although it was known on or about March 7 that many cases sent to hospital proved to be paratyphoid-B infections, and that consequently the sources of infection must have been operative from about Feb. 17, no notice was received by medical practitioners from the Public Health Department of Glasgow until March 16; and whether he would investigate the reason for the delay and endeavour to arrange that notification should be given to practitioners with the utmost promptitude.—Mr. COLVILLE replied: The final diagnosis of paratyphoid-B on March 7 related to three cases only. It was some days later before there was evidence pointing to an epidemic outbreak and the warning to medical practitioners followed on the receipt of this evidence. Immediate steps were taken to trace the source of infection.

Medical News

University of Dublin

At recent examinations at the school of physic, Trinity College, the following were successful:—

M.D.

R. Ed. Hemphill, Cecil Mushatt, and M. F. X. Slattery.

FINAL EXAMINATION FOR M.B., B.CH., B.A.O.

Therapeutics and Pathology.—Elizabeth D. L. Simpson (second-class honours); M. B. Flanagan, A. M. Russell, W. J. Thompson, Catherine E. Craig, J. P. Hearne, C. W. Lloyd, J. C. Watson, Isadore Shribman, A. C. M. Hobson, Dorothy W. M. Last, J. A. Pearce, and J. E. Adamson.

Medicine.—Bernard Kernoff and R. J. S. Wilson (second-class honours); R. R. Hogg, R. F. G. Lyons, J. R. A. Martin, H. F. Kamp, W. F. Rogers, H. J. Smith, David Aiken, Phoebina Eakins, D. R. McCaully, Einhart Kawerau, Moira M. Mallagh, W. B. Dennehy, F. J. Queally, P. F. Longford, E. G. R. Butler, T. H. Downes, J. G. P. Mullally, and F. N. C. Levy.

Surgery.—Lois J. Macaulay and H. H. Balch (first-class honours); Samuel Tennenbaum (second-class honours); David Aiken, R. J. S. Wilson, M. N. O'Riordan, H. J. Smith, G. H. Blennerhassett, Caroline A. McEvett, Lily H. Bamber, Patricia D. Concannon, Annie Dowds, P. H. Rubenstein, Einhart Kawerau, Tom Shier, W. B. Dennehy, Olive S. H. Devlin, J. R. Healy, F. J. Queally, Henry FitzGibbon, J. R. A. Martin, R. M. Halahan, D. O. Hicks, H. F. Kamp, and W. M. Winn.

Midwifery.—C. P. Clancy-Gore, John Moore, J. M. Slattery, W. E. O'C. C. Powell, William Houston, E. C. J. Millar, John Nash, F. G. M. Ross, Louis Solomon, and A. E. Tinkler (second-class honours); Samuel Fine, J. D. Dennehy, Alicia G. Pike, S. O. O. Franklin, L. T. Kelly, B. E. R. Solomons, A. H. H. Guilbride, Edna G. Merrick, D. W. Montgomery, Isidore Shreider, N. M. Smith, J. M. Taylor, R. St. C. Mooney, H. Kitchener Bourns, Kathleen M. Patterson, E. P. Hill, M. D. Leitch, G. W. E. Little,

Gilbert Tattersall, L. C. Jacobson, M. A. Majekodunmi, D. S. M, Enraght-Moony, Myer Steinberg, and N. H. Stewart.

D.P.H.

Part I.—O. F. Warner, P. A. McNally, C. F. O'Reilly, D. K. Sundaresan, P. J. Mullaney, C. G. Reilly, and James Finegan.

D.P.M.

Part II.—J. N. P. Moore.

University of Edinburgh

On March 28 the following degrees and diplomas were conferred :—

M.D.—W. J. G. Barrie (in absentia) and J. D. Mill (in absentia).

M.B., Ch.B.—D. G. Aitken, A. D. F. Corrigall, Alexander Craig, W. M. Down, H. M. Fyvie, A. G. Hassan, V. C. Hassan, J. R. M. Johnston, G. A. D. Lamb, S. M. Mishriki, J. M. H. Mitchell, Andrew Morgan, Jane J. C. Muir, J. B. Porteous, Thomas Rutherford, Alexander Skene, J. M. Sturrock, W. R. N. Sutherland, A. F. Williams and T. M. Wilson.

D.M.R.—J. D. Brown.

Royal Institution of Great Britain

On May 31, at 9 P.M., Prof. W. W. C. Topley, F.R.S., will give a Friday evening discourse to this society. He will speak on bacteria in the air.

Auxiliary R.A.M.C. Funds

The annual meeting of the members of this fund will be held at 2.45 P.M. on Friday, April 19, at 11, Chandos Street, London, W.1.

Pharmaceutical Society of Great Britain

On Tuesday, April 9, at 7.30 P.M. at 17, Bloomsbury Square, London, W.C.1, Dr. C. H. Hampshire, secretary to the British Pharmacopœia Commission, will lecture to the society on Pharmacopœia Revision.

Royal Sanitary Institute

On Tuesday, April 16, at 90, Buckingham Palace Road, London, S.W.1, at 5 P.M., Prof. S. J. Cowell will address the institute on food in war-time.

International Union against Tuberculosis

The award of the Léon Bernard prize has been postponed for two years.

Ling Physical Education Association

This association will hold an Easter holiday course at Morley College, Westminster Bridge Road, London, S.W.1, from April 9 to 13. The lecturers will include Dr. Anna Broman who, on April 9 at 11.15 A.M., will describe the effects of gymnastics upon the spine. In the afternoon Mr. H. Bradley, director of the Boot, Shoe and Allied Trades Research Association, will speak on the relationship of footwear to health. On Wednesday, April 10 at 11.15 A.M., Dr. Grace Calver will discuss important phases in the development of the child. Further particulars may be had from the secretary of the association.

Teaching in a County-Council Hospital

Mr. M. F. Nicholls, dean of St. George's Hospital medical school, has found that association through the Emergency Medical Scheme with the West Middlesex County Hospital has provided his students with "a wealth of clinical material which no London teaching hospital could possess." Accordingly he has asked the Middlesex county council to approve a continuance of the arrangement so that the second-year students may be able to attend the hospital and learn by demonstrations given by the staff of the county hospital and such of St. George's staff as may remain there. For disciplinary purposes the students will be in charge of a member of St. George's staff, who will arrange a time-table under the direction of the medical superintendent of the hospital. Even if St. George's is able to re-open normally the dean hopes, for the sake of the students, that this arrangement may continue. The public health committee of the Middlesex county council have agreed to the proposal, and the school has arranged to pay a fee of £12 a year for each student admitted to clinical instruction at the West Middlesex County Hospital.

Vacancies

Altrincham General Hosp.—Sen. H.S.; at rate of £150.
Bath, Royal National Hosp. for Rheumatic Diseases.—Res. M.O., £150.
Beit Memorial Fellowships.—Junior Fellows, £400.
Birmingham City.—Temp. senior asst. pathologist, 10 gns. per week.
Blackburn Royal Infirmary.—Res. H.P., at rate of £175.
Bradford City.—Res. surg. O. for Municipal General Hosp., £250.
Bradford Royal Infirmary.—H.P. to radium and skin dept., £200.
Bradford Royal Infirmary.—H.S., at rate of £150.
Brighton, Sussex Eye Hosp., Eastern Road.—H.S., at rate of £150.
Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.
Bury St. Edmund's, West Suffolk General Hosp.—H.S., at rate of £150.
Cambridge, Addenbrooke's Hosp.—H.P., at rate of £130.
Chester, City Hosp.—Jun. res. M.O., at rate of £150.
Chester, Upton Emergency Hosp.—Jun. res. H.S. Also jun. res. H.P., each £200.
Coventry and Warwickshire Hosp.—Res. surg. O., £300. Also H.S.'s and H.P.'s to spec. depts., each at rate of £150.
Derbyshire Royal Infirmary.—H.S. for cas. dept., £150.
Doncaster Royal Infirmary.—Cas. H.S., at rate of £150.
Dudley, Guest Hosp.—Cas. H.S., £150.
Ealing, W.13. King Edward Memorial Hospital.—Cas. O. and H.S. at rate of £150.
Essex Administrative County.—Third asst. M.O. for Essex County Hosp., £350.
Folkestone, Royal Victoria Hosp.—Res. H.S., £130.
Golden Sq. Throat, Nose, and Ear Hosp., W.1.—Hon. clin. assts.
Halifax Royal Infirmary.—Cas. O., at rate of £150.
Heston and Isleworth Borough.—Asst. M.O., £550.
Hôpital et Dispensaire Français, 172, Shaftesbury Avenue, W.C.2.—Anæsthetist, £25.
Huddersfield Royal Infirmary.—H.P., at rate of £150.
Hull Royal Infirmary.—Res. anæsthetist, at rate of £150.
Kidderminster and District General Hosp.—Jun. H.S., at rate of £100.
Lancashire County Council.—Jun. res. M.O. for Lake Hosp. and Darnton House Institution, at rate of £225.
Leeds Education Committee.—Asst. school M.O., £500.
Leicester City.—Res. M.O. for City General Hosp., at rate of £300.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. to med supt., £225.
Liverpool, Royal Children's Hosp.—H.S. for City Branch, at rate of £100. Also res. M.O. and res. surg. O. for Heswall Branch, each at rate of £120.
Maidstone, Kent County Ophthalmic and Aural Hosp.—Two H.S.'s to spec. depts., each at rate of £200.
Manchester Ear Hosp., Grosvenor Square.—Res. H.S. Also H.S., £120 and £150 respectively.
Manchester Royal Infirmary.—Five H.S.'s to spec. depts., each at rate of £50.
Manchester Victoria Memorial Jewish Hosp., Cheetham.—Res. M.O., at rate of £125.
Market Drayton, Cheshire Joint Sanat.—Third asst. M.O., £250.
Middlesbrough, North Riding Infirmary.—Cas. O., at rate of £150.
Newport County Borough.—Temp. asst. M.O.H., at rate of £500. Also asst. res. M.O., at rate of £200.
New Zealand, Otago Hosp. Board, Dunedin.—Radiotherapist, £1200.
Norwich, Norfolk and Norwich Hosp.—H.P., £120.
Oldham County Borough.—Res. obstet. officer for municipal hosp., £350. Also res. asst. M.O. for the municipal hosp., at rate of £200.
Preston and County of Lancaster Queen Victoria Royal Infirmary. H.S. and H.S. to eye, ear, nose, and throat depts., each at rate of £150.
Reading, Royal Berkshire Hosp.—H.S. to maternity dept. and H.P., each at rate of £150.
Redhill, Surrey County Hosp.—Res. asst. M.O., at rate of £250.
Redhill, Surrey, Royal Earlswood Institution.—Asst. M.O., £350.
Rhondda Urban District Council.—Asst. M.O., £500.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Royal Cancer Hosp. (Free), Fulham Road, S.W.3.—Asst. pathologist, £500.
Royal Masonic Hosp., Ravenscourt Park, W.6.—Two res. M.O.'s, each £300.
St. Peter's Hosp. for Stone, &c., Henrietta Street, W.C.2.—H.S., £75.
Sheffield Royal Hosp.—Ophth. H.S., £120.
South Shields County Borough.—H.S. for General Hosp., at rate of £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Radiotherapist, £500.
Swanley, Kent, Hosp. Convalescent Home, Parkwood.—Res. M.O., at rate of £200.
Taunton, Taunton and Somerset Hosp.—H.P., at rate of £125.
Walsall General Hosp.—H.S., £150.
Weir Hosp., Weir Road, Balham, S.W.12.—Sen. and jun. res. M.O., £200 and £150 respectively.
Weston-super-Mare Hosp.—Res. H.S., £150.
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S., at rate of £150.
Winchester, Royal Hampshire County Hosp.—H.S., at rate of £100.
Wolverhampton Royal Hosp.—Two H.S.'s to spec. depts., each at rate of £100.
Worcestershire, Barnsley Hall Emergency Hosp., Bromsgrove.—Four jun. res. M.O.'s, each at rate of £200–£350.

The Chief Inspector of Factories announces vacancies for examining surgeons at Penygroes, Caernarvon; and Llanwrtyd Wells, Brecon.

Medical Diary

Week beginning April 8

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2.

TUESDAY—5 P.M., Mr. Gwynne Williams: Intestinal Obstruction.

THURSDAY—4 P.M., Mr. E. W. Hey Groves: Life and Work of Moynihan. (Moynihan lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

TUESDAY

Psychiatry—4.30 P.M., Dr. Derek Richter: The Action of Adrenaline in Anxiety. Dr. W. Sargant: Simultaneous Respiratory and Electroencephalographic Recordings in Cases of Petit Mal.

THURSDAY

Dermatology—4 P.M., Cases, 5 P.M., clinical meeting.

FRIDAY

Clinical—2.15 P.M., Mr. J. E. H. Roberts: Total Pneumonectomy for Bronchiectasis. Dr. E. M. Fraenkel: Recurrent Tumour in a Case of a Sarcofibroid of the Small Intestine.

CHADWICK LECTURE.

TUESDAY—2.30 P.M. (26 Portland Place, W.1.), Mr. W. H. Hamlyn, F.R.I.B.A.: Camps—Their Design, Construction, and Hygienic Arrangement.

EDINBURGH ROYAL INFIRMARY.

THURSDAY—4.30 P.M., Prof. F. P. Fraser: The Effort Syndrome in the Present War. (Honyman Gillespie lecture.)

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY—3.30 P.M. (Bolingbroke Hospital, S.W.11.), Dr. P. M. F. Bishop: Present-day Applications of Sex-hormone Therapy.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY—8.30 P.M. (11, Chandos Street, W.1.), Dr. Plewa, Individual Psychology Technique.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

WEDNESDAY—11.30 A.M., clinico-pathological conference (medical); 3 P.M., clinico-pathological conference (surgical).

THURSDAY—2 P.M., Dr. Duncan White: radiological conference.

FRIDAY—2 P.M., clinico-pathological conference (gynæcological). 2.30 P.M., Dr. C. M. Hinds Howell: ward clinic. 2.30 P.M., Mr. V. B. Green-Armytage: sterility clinic.

DAILY 10 A.M.–4 P.M., medical clinics; surgical clinics and operations; obstetrical and gynæcological clinics and operations. 1.30–2 P.M., post-mortem demonstration.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

Medical Society of London, 11, Chandos Street, W.1. TUES., 5 P.M., Mr. J. Swift Joly: Bladder. THURS. 5 P.M., Mr. H. J. B. Atkins: Carcinoma of the Breast.—St. Mary's Hospital, Paddington, W.2. WED., 5.30 P.M., clinical F.R.C.S. class.—Brompton Hospital, S.W.3. TUES., 5.30 P.M. THURS. 5 P.M., M.R.C.P. course in chest diseases. Royal National Orthopædic Hospital, Brockley Hill, Stanmore. FRI., 2 P.M., F.R.C.S. orthopædic course.—Royal Cancer Hospital, Fulham Road, S.W.3. Daily, 9.30 A.M., F.R.C.S. course.—Practical operative surgery course for F.R.C.S. (days and times by arrangement).—Royal College of Surgeons, Lincoln's Inn Fields, W.C.2. WED., 3.30 P.M. and THURS. 3 P.M., F.R.C.S. pathology course.

Appointments

BENNION, E. R., M.B. Lond., D.P.H., tuberculosis officer and deputy medical officer of health for Tipton.

CLARK-MAXWELL, G. S., M.B. Durh., hon. neurological surgeon to Derbyshire Royal Infirmary, Derby.

COOTE, GWENDOLINE, K. G., M.B. Lond., temporary assistant school medical officer and assistant medical officer of health for Nuneaton.

CUNNINGHAM, ROBERT, M.B. Glasg., D.P.H., medical superintendent at Poole Sanatorium, Nunthorpe.

DE LARGY, JOHN, M.D. Belf., L.M., first assistant medical officer at Leytonstone Central Home.

D'OFFAY, T. M., M.B. Edin., F.R.C.S., deputy medical superintendent and surgeon at Leicester General Hospital.

GOOD, R. A., M.B. N.U.I., D.P.H., medical officer of health for Winchester.

GRACIE, A. P., M.B. Edin., resident surgical officer at Corbett Hospital, Stourbridge.

JONES, A. M., M.B. Manc., resident medical officer at Manchester Royal Infirmary.

NIVEN, EDITH G., M.R.C.S., temporary assistant school medical officer for Derbyshire.

ROBERTS, G. H. B., M.B. Dubl., D.P.H., L.M., resident medical officer at Leicester Isolation Hospital.

ROSS, R. M., M.B. Edin., D.P.H., resident medical officer at Leicester Isolation Hospital.

WILSON, GEORGE, M.B. B.Hy. Durh., D.P.H., deputy county medical officer for Durham.

ROYAL CANCER HOSPITAL (FREE), LONDON.—The following appointments are announced:—

LEDLIE, R. C. B., M.B. Lond., F.R.C.S., surgeon;

SPARKS, J. V., M.R.C.S., D.M.R.E., senior radiologist (part-time) in the diagnostic section;

GOLDING, F. C., M.B. Sydney, M.R.C.P., D.M.R.E., radiologist (part-time) in the diagnostic section; and

JACKSON, H. H. W., M.B. Lond., resident medical officer.

Medical referee under the Workmen's Compensation Act, 1925. Dr. E. L. H. JONES for ophthalmic cases in circuits 21, 22, 23, and 36.

Births, Marriages and Deaths

BIRTHS

ALDERSON.—On March 22, in Hull, the wife of Dr. F. G. S. Alderson—a daughter.

DUGGAN.—On March 30, at Forest Hill, S.E., the wife of Dr. F. R. Duggan—a son.

KIRKWOOD.—On March 29, at New Malden, the wife of Surgeon Lieutenant R. M. Kirkwood, R.N.—a daughter.

LILLICO.—On March 30, at Rochdale, the wife of Captain J. W. Lillico, I.M.S.—a son.

ORLEY.—On March 26, at Haywards Heath, the wife of Dr. Alexander Orley—a son.

REEVES.—On March 28, the wife of Mr. Brian Reeves, F.R.C.S.E., R.A.M.C.—a daughter.

RICHARDSON.—On March 25, the wife of Major J. S. Richardson, R.A.M.C., of Chorley Wood—a daughter.

MARRIAGES

BOUCHER—HASSLACHER.—On March 30, at Brompton Oratory, Anthony Boucher, D.M., to Cecily Hasslacher.

GODBER—PETIT.—On March 30, in London, Greville Noel Lambert Godber M.R.C.S., to Gwendoline Ursula Petit.

LENDON—MCNEILL.—On Feb. 3, in Bombay, Nelson Courtney Lendon, M.B., Captain, R.A.M.C., to Helen McNeill of Ruthergien, Scotland.

MARTIN-JONES—FIGGIS.—On March 30, at Carmarthen, John Dennis Martin-Jones, M.D., R.A.M.C., to Margaret Figgis.

SEEX—POULSEN.—On March 30, at Chipstead, Ian Harry Macgregor Seex, F.R.C.S.E., to Esther Poulsen of Reykjavik, Iceland.

SIMPSON—PODMANICZKY.—On March 29, at Bournemouth, Samuel Levy Simpson, M.D., to Baroness Heddy Podmaniczky.

DEATHS

HARDWICKE.—On March 30, in London, William Wright Hardwicke, M.D. St. And., M.R.C.P.E., aged nearly 92.

KEEP.—On March 26, in London, Major Arthur Corrie Keep, M.C., M.D. Edin., aged 78.

LISSAMAN.—On March 30, at Pucklechurch, near Bristol, Thomas Lissaman, M.R.C.S., aged 79.

STAINTON.—On March 24, on active service near Cape Town, Philip Geoffrey Stainton, M.R.C.S., Surgeon Lieutenant, R.N., aged 31.

GEOLOGIST AND SURGEON

MANY medical men have played truant and achieved success in a foreign field, but few have led a busy professional life and yet reaped greater fame in a side-line. Such a man was Gideon Mantell (1790–1852), who while continuing to practise collected vast quantities of fossils, including the iguanodon and other giant lizards of the Sussex weald. He was a keen antiquarian and botanist, with a love of romantic scenery, and made an ascent in a balloon. In 1833 he moved to Brighton to be near the courtiers, but the surgeon was eclipsed by the geologist and his practice suffered. Five years later he sold his collection of 1300 specimens, the fruit of twenty-five years, to the British Museum for £4000 and settled down to practise in London, where he delivered many public lectures, attended various scientific societies, and quarrelled with Sir Richard Owen. Dr. Curwen has edited Mantell's journal for the years 1818–52 (Humphrey Milford, Oxford University Press. 1940. Pp. 315. 12*s.* 6*d.*) and Mantell's diverse interests make it a useful guide to events and people of that time. His dissipation of energy led to coronary disease towards the end of his life, and his poor physical condition was intensified by a postural scoliosis, which such eminent surgeons as Robert Liston, Lawrence, William Coulson, and Sir Benjamin Brodie incorrectly diagnosed as an abscess during his life. His spine is preserved in the museum of the Royal College of Surgeons.

Dr. Curwen is to be congratulated on his presentation of the diary, and especially on his having tracked down and photographed Mantell's name carved inside a hollow oak at Penshurst in 1809.

NOTES, COMMENTS AND ABSTRACTS

HELPING THE HANDICAPPED

ON March 19 Dame Georgiana Buller reminded the annual meeting of the Central Council for the Care of Cripples that today when we were being urged to avoid all waste, economy in our most precious commodity, human material, was essential. The last war had seen the development of clinical orthopædic treatment, but this was only the first half of the problem of the cripple. There remained the rehabilitation of the permanently disabled. After his treatment proper the cripple's first need was remedial work to give him the maximal restoration of function in the shortest time and to help him to recover his habit of work or to build up a new one. Manual occupation tended to improve the patient's outlook and occupational therapy often gave better results than massage and physical therapy alone. Though remedial work as a phase of rehabilitation is distinct from vocational training, they are interdependent and cannot be separated without detriment. Indeed Dame Georgiana considers that they can with advantage be carried out side by side in the same building, for the disciplined workshop environment of the training-centre provides a favourable background for the re-adjustment of the injured person's outlook. Today work is no longer limited to long-term training for crafts such as tailoring and upholstery. The American Federal Board of Rehabilitation has drawn up a list of more than 700 occupations in which short-term training has fitted the cripple to hold jobs on equal terms with the able-bodied. There remained a small number of cripples who would always need sheltered conditions of work, probably with medical supervision. She thought these sheltered workshops could conveniently develop alongside the training-centre or "conditioning-centre," as she preferred to call it. In addition to the remedial department, the vocational training department, and the sheltered workshops the ideal centre should include hostels for resident workers and patients, recreational facilities including a swimming-bath, a medical block, a workshop for repairing surgical appliances, and an advisory bureau. She stressed the importance of the advisory bureau, for expert advice on the possibilities of his new life is what the cripple most often lacks. The centre might also help to market goods made by home-bound workers and thus offer them a measure of economic independence. Dame Georgiana looked forward to the day when there would be a chain of these regional conditioning centres throughout the country linking the hospitals with industry.

SOUND ADVICE ON CHILD FEEDING

MEDICAL publications from the United States are sometimes accused of being superficial, but when an American really gets down to the subject he makes an extraordinarily good job of it. "Your Child's Food," by Miriam E. Lowenberg [1] is an example of industry, enthusiasm and knowledge which writers of similar books on this side of the Atlantic might well follow. In Great Britain we have one professor of dietetics to 40,000,000 people, and dietetics is taught in a hole-and-corner way. In one state of the United States they have two, and that not a densely populated state. Miss Lowenberg is an assistant professor of foods and nutrition at Iowa State College; there is a professor, two associate professors, and two other assistant professors. Consequently the author can give her whole time to the important topic of child feeding, and produce a book of immense value. It is not an example of "knowing more and more about less and less" but a sane all-round book which every pædiatrician and dietitian should read and inwardly digest. The only criticisms of the book are of diffuseness, repetition and cost. But even the differences and repetition are valuable, since the book is not intended mainly for the academic but for the mother in the house. At times there is an unnecessary vagueness—e.g., "vegetables are high in mineral and vitamin content" and "they (white flour and milled cereals) cause a feeling of satiety in the child without giving him minerals and vitamins." A consideration of tables would modify the statement that vegetables are "high" in mineral content, and show that whole meals are of little value except in giving iron and vitamin B_1.

Half of the book consists of a year's menus for midday meals for children, with recipes. Miss Lowenberg makes some useful suggestions for inculcating good food habits in children and overcoming their natural dislike of new tastes and textures. These are based on her supervision of many thousands of meals served in the nursery school at Iowa State College. We commend her advice to all parents of pernickety children and especially her remark that "Adults must avoid discussing their own food dislikes before children or showing these by their facial expressions." "Many a run-about when rifling the ice-box," she says, "will turn down delicacies and consume a whole bottle of cod-liver oil." Most of the objections to fish-liver oil are due to its being started too late or to the parents' suggestion that it is nasty. The author prefers cod-liver oil to the more concentrated oils and suggests: "it is advisable to buy only reliable brands of cod-liver oil—those manufactured by companies maintaining laboratories for testing the vitamin content of their products and those whose product is approved by the Council of Foods of the American Medical Association." When shall we, in this country, insist that manufacturers guarantee the vitamin contents of the commodities they sell or persuade the B.M.A. to institute such a council?

1. Your Child's Food. By Miriam E. Lowenberg, Assistant professor of foods, nutrition and child development, Iowa State College, U.S.A. London: McGraw-Hill Publishing Company. 1939. Pp. 299. 12s. 6d.

REFLECTIONS ON A RED CROSS MANUAL

THE new edition of the Red Cross note-book [1] that was first published at the beginning of the last war raises some questions of general principle in first-aid instruction. Young ladies enrolled as ambulance drivers sometimes complain of having to learn the Latin names of bones, and the good English words thigh-bone, arm-bone, collar-bone and blade-bone should in fact be good enough for any Red-Cross or county-council examiner. With the leg and fore-arm it is different: there being two bones in each we cannot get away from tibia and fibula, or radius and ulna. But femur, humerus, clavicle and the like might well disappear from the note-book diagram of the skeleton, or perhaps it would be best to write blade-bone (scapula) and knee-cap (patella). There is certainly no need for the first-aid worker to know the different parts of the pelvis or even to have heard the word metacarpal. Hand and foot bones as distinct from finger and toe bones are enough. It is the same with the soft parts. We speak of the heart and lungs, not of the cor and pulmonæ. Why then should girls have to worry about the trachea and œsophagus? In the abdomen there is some excuse. Belly and guts are not pretty words, and they might frighten a mother or school-ma'am who was considering whether to allow her daughter or pupil to study elementary anatomy.

In the teaching of first-aid no attempt seems to be made to describe how the body is built up. It may be necessary to begin with big things that everyone can discover on his or her own body, such as bones and arteries, but teaching should pass on to the cells, tissues, organs and systems of the body. It is doubtful whether the first-aid student need know the different types of vertebræ, but in the note-book it

1. British Red Cross Society Note Book. (2nd ed.) Edited by St. J. D. Buxton, M.B., F.R.C.S. London: Humphrey Milford, Oxford University Press. 1940. Pp. 100. 2s. 6d.

would be well to add a cross-section of the medulla to the figure of the atlas and one of the spinal cord and emergent nerves to that of the thoracic vertebra. The diagrams of the brain should also be imposed in continuity on that of the spinal cord. This would leave a page for a simple diagram showing how the nervous system is constructed and serving as an introduction to the idea of the reflex arc. The clinical diagrams arouse criticism on other grounds. The ones illustrating compression of the great vessels give no idea of the amount of force needed. The first-aid worker pressing on the subclavian looks as though he were giving the boy an encouraging pat on the shoulder. In the illustration of femoral compression, too, the hands are trying to compress the artery at a point much lateral to it; and no-one would be able to apply the pad or tourniquet recommended with those hands in the way. The truth is that it is very difficult to compress the femoral artery against the shaft of the thigh-bone—the proper place is against its head or against the pelvis above it. The first-aid worker is then at the side of the patient's body so that he and his hands are out of the way of the worker who is applying the tourniquet. But he has to throw his whole weight from the shoulder to control it. The phrase "firm pressure is necessary" is quite inadequate.

The general plan of the note-book, with diagrams on the left and a blank page opposite for notes, is excellent, and it fulfils a need that will become more pressing before we are done. But it indicates a frame of mind that thinks names more important than things, and is satisfied when a structure has been described without entering into its meaning. A good lecturer can correct this fault, but the next edition should include diagrams illustrating the anatomy of such physiological principles as the reflex arc, the structure of an organ, the natural arrest of hæmorrhage, and the early changes in inflammation.

NEW PREPARATIONS

TABLOID EMOCIN THROAT LOZENGE.—These lozenges have been introduced by Burroughs Wellcome & Co. (Snow Hill Buildings, London, E.C.1) as a convenient form for the relief of inflammatory conditions of the throat. Each lozenge contains 2 grains of acetylsalicylic acid combined with a flavoured demulcent base, and when it is dissolved slowly in the mouth has an analgesic effect at the site of contact.

I.V.S. (B.D.H.).—We have received from British Drug Houses Ltd. (Graham Street, N.1.) a publication describing their epidemic influenza virus suspension, I.V.S. (B.D.H.), which is now available for general use. This preparation is stated to be free from danger in administration and yet to possess as great an immunogenic activity as a living virus suspension. Its dosage is 1 c.cm. administered by subcutaneous injection and it is said that the immunity resulting from this infection lasts for about twelve months. It should be administered one to two months before the possible onset of an epidemic.

PYELECTAN is the trade-mark name under which Glaxo Laboratories Ltd. (Greenford, Middlesex) have made available as a British product a solution of the bisodium salt of 3:5-di-iodo-4-pyridoxyl-N-methyl-2:6-dicarboxylic acid for use as a contrast-medium in intravenous pyelography The value of this organic iodine compound rests on its satisfying the following requirements: (1) density and clear definition of resulting shadow, (2) low toxicity, (3) inactivity of the iodine, (4) toleration in all conditions except severe renal impairment, severe hepatic dysfunction and serious general illness.

CEDILANID.—This is a new product in the Sandoz series presented by J. Sandoz Products Ltd., 134, Wigmore Street, W.1. It is the brand name for lanatosid C, a native glucoside of *Digitalis lanata*. Experimental work by G. K. Roe and M. B. Visscher (*J. Pharmacol.* 1938, **64**, 65) implies that lanatosid C has a greater margin of safety in improving cardiac efficiency than the other two glucosides in *d. Lanata*. It would therefore seem to offer advantages in the treatment of heart-failure where for hæmodynamic reasons excessive slowing is not desirable. By increasing the dosage the slowing of the heart-rate typical for digitalis may be obtained. Cedilanid is available in tablets and solution for oral administration, in ampoules for intravenous injection, and in suppositories.

GYNOMIN.—We are advised by Coates and Cooper Ltd., 94, Clerkenwell Road, E.C.1, that the chemical contraceptive tablet which has hitherto been known as Speton will in future be sold under the name of Gynomin. There will be no change in the product itself.

IDOZAN is a stabilised solution of ferric hydroxide containing 5 per cent. Fe in a palatable form. The ferric iron is gradually liberated from the preparation in the stomach and intestine becoming rapidly reduced to ferrous iron, according to the statement of the manufacturers, Coates & Cooper Ltd., 94, Clerkenwell Road, E.C.1.

CALFOS BRAND TABLETS.—The makers of this product (Calfos Ltd., Imperial House, Kingsway, W.C.2) state that it is a preparation of the unaltered basic constituent of bone prepared without the use of chemicals. Each tablet contains the equivalent of 1·7 grains of calcium, and phosphorus is present in the correct physiological ratio. The product is presented as a suitable means for the administration of calcium and phosphorus in easily assimilable form.

NIPECTIN is the baptismal name of a combination of pectin and 0·15 per cent. nickel. The metal is added to make the pectin more soluble than it is in its simple state and to enhance its bacterial properties. The product is in granular form and is presented by the makers (Eli Lilly & Co. Ltd., Basingstoke, Hants) in packages containing four ounces. It may be administered in such foods as soup, mashed potatoes, milk and cocoa. Nipectin treatment is a refinement of apple therapy, for pectin is a hydrophilic colloid present in apples and other fruits. It is suggested for use in the treatment of diarrhœa and dysentery.

PHARMACEUTICAL SPECIALITIES (May & Baker, Ltd), Dagenham, have issued a booklet dealing with the use of N.A.B. in the treatment of syphilis. Copies will be sent to any member of the medical profession on request.

REDIVIVUS

AFTER a refreshing sleep of over a quarter of a century the *Quarterly Bulletin of Northwestern University Medical School* has resumed publication. It is intended to serve as a link between "the basic sciences" and clinical medicine and surgery. The sequence of volumes is not interrupted, the first issue of the new series being called no. 1 of vol. 14. In it Sumner L. Koch writes on the repair of divided nerves and tendons, D. S. Hillis on ectopic pregnancy, A. J. Kendall and C. A. Colwell on the effect of ultraviolet radiation on bacteriophage, J. F. Delph on benign tumours of the larynx, W. F. Windle on the fœtal circulation, M. H. Barker on pneumococcal pneumonia, J. P. Simonds on coronary thrombosis, H. A. Davenport and F. B. Queen on the local effects of colchicine on the skin and testis of the white rat, J. G. Carr on coronary disease in physicians, and B. J. Anson on books about the great plague of London. The resurrected quarterly is well printed and illustrated, and the annual subscription in this country is $2.50.

EXPRESSIVITY

X. Y. Z.—The word used in a review of Julia Bell's "Hereditary Ataxia" (March 16, p. 504) is a convenient rendering of the German word *Expressivität*, which was coined by the geneticist Timofeeff-Ressovsky to denote the quality of certain genes of expressing themselves to a different degree in different cases. For instance, the gene (or genes) responsible for epiloia may express itself as a few scattered and unimportant abnormalities of the skin or as a widespread and severe disturbance, involving body, brain, and mind. The meaning of the word being highly specific, its addition to the medical vocabulary is probably justified.